Safety Regulation Group
Licensing and Training Standards

Standards Document 18, Version 4

EASA Requirements Flight Crew Licensing

Notes for the qualification and approval of Flight Navigation Procedures Trainers (FNPTs) and Basic Instrument Training Devices (BITDs)

PLEASE NOTE THAT THIS DOCUMENT IS FOR GUIDANCE PURPOSES ONLY. THE LATEST VERSION OF THIS DOCUMENT CAN BE VIEWED ON THE LICENSING AND TRAINING STANDARDS WEBSITE

Contents

Foreword

Part 1 **General Information**

Part 2 **EASA Requirements**

Part 3 **Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Part-ORA.FSTD**

Part 4 **Evaluation Process and Timetable – FNPTs**

Part 5 **Recurrent Qualification Checklist**

Part 6 **Available Credits**

Foreword

The Part-FCL requirements for Flight Crew Licensing provide for the use of Flight and Navigation Procedures Trainers (FNPTs) and Basic Instrument Training Devices (BITDs) for some of the training and tests of competency called for under the provisions of the Requirements.

The primary reference documents for the Qualification of FNPTs and BITDs are:

- CS-FSTD A: Aeroplane Flight Simulation Training Devices
- CS-FSTD H: Helicopter Flight Simulation Training Devices

The purpose of this document is to explain and, where necessary, clarify the provisions of the primary reference documents in order to give guidance on the requirements to be met when Operators wish to have FNPTs or BITDs evaluated.

Nothing in the document is intended to conflict with the current EU/EASA Regulations or other legislation, which remains the primary authority. Whilst every effort is made to ensure that all information in this document is correct the CAA reserves the right to amend this document as required to reflect changes in practice required for the effectiveness of the Qualification process.

Throughout this document the term “Operator” is used to denote a person, organisation or enterprise seeking qualification of a FNPT or BITD. The term “User” denotes a person, organisation or enterprise requesting training, testing or checking credits through the use of a FNPT or BITD.

Users should note that the qualification of a FNPT or BITD under CS-FSTD A/H does not automatically mean that the device can be used for training. Users must gain approval to use the device, by application to Licensing and Training Standards (Approvals Support), as part of their training programmes. It is possible that an Operator could have a device that has been qualified under CS-FSTD A/H and that is used by more than one User. In such cases each User must apply for a separate approval for their training programme but the device requires only the single qualification.

This document does not apply to the qualification of Full Flight Simulators or any Flight Simulation Training Device (FSTD) other than FNPTs and BITDs. Standards Document 18 and other Standards Documents are also available on the SRG Safety Net web site and will be distributed to users without charge.

If, after reading this document, you still have queries about the Qualification of FNPTs or BITDs, please contact Licensing and Training Standards (Approvals Support).

Civil Aviation Authority
Licensing and Training Standards
Approvals Support
Aviation House
Gatwick Airport South
West Sussex RH6 0YR

Tel No: 01293 573700

Fax No: 01293 573996

Part 1 General Information

1.1 **Qualification**

A FNPT or BITD is awarded a qualification when it has been demonstrated that it meets the requirements of CS-FSTD A (for Aeroplanes) or CS-FSTD H (for Helicopters) as applicable. An evaluation of the device is carried out which consists of an objective and a subjective review of the standard of the device and its fidelity by a suitably qualified inspection team composed of Authority Staff. This assessment process is detailed within Part ARA.FSTD.100 and AMC1 ARA.FSTD.100(a)(1) and Part ORA FSTD 100 and 200. In addition, in order to show continued compliance with CS-FSTD A or H and Part ORA an Operator is required to establish a Compliance Monitoring System (CMS) that will demonstrate the Operator's capability to maintain the performance, functions and other characteristics specified for the device. Without the basis of a CMS in place the device will be unable to gain an Initial Qualification. The requirements for the CMS are detailed in Part ORA, Chapter 4, subpart FSTD and the associated Acceptable Means of Compliance (AMC) and Guidance Material (GM).

1.2 **Approvals and Acceptance**

1.2.1 Use of the word 'approval' invariably implies signature to a document. The document gives expression to the CAA's legal finding and will be drawn up in accordance with European Regulations. An approval may stipulate conditions, which the CAA wishes to attach. Before an approval can be granted, the CAA must first make a satisfactory technical finding (the qualification).

1.2.2 The maximum training, checking and testing credits attainable based on the qualification level of the FSTD do not imply an automatic approval for any FSTD User. The approval granted by the CAA has to take into account the level of experience of the FSTD User as determined by assessment. Correspondingly, credits granted under the given approval may not exceed the maximum credits attainable based on the qualification level of the device but they may be less. The governing requirements applicable to FSTD Users are contained in Commission Regulation (EU) No.290/2012, Articles 10 and 11, and Annex VI (Part ARA) and Annex VII (Part ORA) and the associated AMCs and GM.

1.2.3 The expression "acceptable to the Authority" occurs in the text of CS-FSTD and needs explanation. It refers to those subjects or proposals on which the Authority may decide how its agreement is to be given. For any item to be considered accepted by, or acceptable to, the Authority, the Authority will give a positive indication that this is the case.

1.3 **Format**

This document should be read in conjunction with the relevant primary reference document. The primary reference, either Part-FCL, or CS-FSTD A/H will be listed followed by explanations or clarification as required, if there is no comment needed this will be stated. Reference may also be made to the Authority Requirements for Aircrew, Annex VI (Part ARA) and the Organisation Requirements for Aircrew, Annex VII (Part ORA).

Part 2 EASA Requirements

2.1 **CS-FSTD A/H.001 Applicability**
To operate the device it has to be qualified; to use the device the User must have an approved course.

2.2 **CS-FSTD A/H.200 Terminology**
Self-explanatory.

2.3 **CS-FSTD A/H.001 Implementation**
Self-explanatory.

2.4 **CS-FSTD A/H.300 Application for FNPT/BITD Qualification**
Contact Licensing and Training Standards (Approvals Support) for UK specific application form.
N.B. provisions of Part ORA.FSTD.200

2.5 **CS-FSTD A/H.300 Qualification Basis**
Self-explanatory.

2.6 **Part ORA.FSTD Rules Governing Operators**

(a) Compliance Monitoring Programme (CMP) is the terminology that now includes the Quality System: the requirements are explained in detail in AMC1 ORA.FSTD.100 and the accompanying GM. The FSTD CMP would normally be a separate section or annex to the ATO CMP/QS. In all cases it is strongly advised that early contact for advice and guidance be made with the Licensing & Training Standards (Approvals Support).

(b) Updating and Modifications: self-explanatory.

(c) Installations: self-explanatory.

(d) Additional Equipment: self-explanatory.

2.7 **CS-FSTD A/H. Requirements for FSTD qualified after 8th April 2012**
In the case of FNPTs the regulations do not allow the Authority to deal directly with manufacturers; it is the Operators responsibility to ensure that a device meets the requirements of CS-FSTD A/H. It is also in the Operator's

self interest to ensure that the device meets his own training and commercial requirements before it is qualified because any changes afterwards may require a further evaluation. With a BITD the initial qualification is the responsibility of the manufacturer and this difference is reflected in AMC1 FSTD(A/H).300, paragraph (6)(ii). For FNPTs the QTG must be submitted by the Operator, for a BITD the manufacturer would submit the QTG.

2.8 **AMC3 FSTD A/H.300 (Interpretative material)**
Before looking in detail at the Technical Requirements it is recommended that prospective FNPT Operators read AMC3 FSTD A/H.300 for background information. The Authority attaches a lot of importance to the sentence in paragraph (b) (1) that says, "The configuration chosen should sensibly represent the aircraft likely to be used as part of the overall training package". For example an Operator with a device that represents a PA44 but flying a BE76 should not have a problem but if that same Operator changed to a PA34T (turbo-charged) or a PN68 (roof mounted magneto switches) there would be credit adjustments (User Limitations) in the User approval due to these differences – further discussed in Part 6. If in doubt contact the Licensing & Training Standards (Approvals Support) for advice.

2.9 **Article 10b 2. – JAR-compliant FSTD Qualification certificates issued or recognised before this Regulation applies shall be deemed to have been issued in accordance with this Regulation.**
Self-explanatory.

2.10 Part-ORA.FSTD.230 Changes to Qualified FNPTs/BITDs
Self-explanatory.

2.11 **Part ARA ARA.FSTD.115 Interim FSTD Qualification**
Unlikely to be used in practice for these devices.

2.12 Part-ORA.FSTD.235 Transferability of FNPT/BITD Qualification
Self-explanatory.

Part 3 Acceptable Means of Compliance (AMC) and Guidance Material (GM) to CS-FSTD(A/H) & Part-ORA.FSTD

3.1 **AMC1 ORA.FSTD.200 Part A. FNPT Qualification – Application and Inspection**

3.1.1 Letter of Application: Contact, Licensing and Training Standards (Approvals Support) for an application form.

3.2 **AMC1 FSTD(A/H).300 (Subpart C), para (8)** emphasises that the QTG (Qualification Test Guide) should be submitted as early as possible.

3.2.1 **AMC1 FSTD(A/H).300 (Subpart C), para (9),sub-para (ii)** states "the QTG should be run progressively in at least four approximately equal three-montly blocks on an annual cycle between evaluations".

3.2.2 The Subjective Testing is an integral part of the QTG and must be run, progressively, in parallel with the Objective Testing.

3.3 **AMC1/GM1 ORA.FSTD.100 Compliance Monitoring Programme**

See comments at Part 5 of this document.

3.4 **AMC1 FSTD(A/H).300, para (5)** Testing for FSTD qualification.
The Initial Qualification requirements for the QTG.

Reference is made to sub-para (iv) and the description of what is acceptable as Validation data (and the production of an engineering report). Further information should be sought by contacting the Authority's FSTD Standards section as well as referring to EASA web site:

FNPT Validation Data Requirements:
http://www.easa.europa.eu/ws_prod/c/doc/FSTD_DOC/FNPT%20Validation%20Data%20Requirements.pdf

FNPT Proposal (note this describes FNPT Evaluation and Qualification Procedure)
http://www.easa.europa.eu/ws_prod/c/doc/FSTD_DOC/FNPT%20Proposal%20EH-MvA.pdf

3.4.1 **AMC1 FSTD(A/H).300 para (6) -** Requirements of the QTG.

Although, in the case of a FNPT, it is the Operators responsibility to submit the QTG it is the manufacturer who will actually produce it. After the initial qualification, the QTG will only be approved as the Master QTG (MQTG) when all the discrepancies in the QTG have been addressed to the satisfaction of the Authority.

3.4.2 Para 9, Sub-para.(ii) – Recurrent qualification requirements.

Tests should be run progressively, dated and retained, this may be as paper copy or in electronic format as long as access for review is straightforward. *"It is not acceptable that the complete QTG is run just prior to the annual evaluation"*.

3.4.3 Para 9, Sub-para (b) - Table of FSTD Validation Tests - the Operator is required to run all the relevant tests progressively through an annual cycle. Functions and Subjective Tests - these are of equal importance to the Validation Tests and should be scheduled in the same way. Any company pilot or Instructor can be tasked to fly the tests but there should be one Nominated Pilot who has the final responsibility in defining what is acceptable and desirable in the handling qualities.

Part 4 Evaluation Process and Timetable – FNPTS

This Part should be read in conjunction with the flow chart as shown at Appendix 1.

4.1 Even before entering the Flow Chart prospective Operators may wish to discuss their plans with Licensing and Training Standards (Approvals Support), such an approach is usually very productive and is actively encouraged.

4.2 It is important that Operators be clear what they want from their device before entering into detailed negotiations with a manufacturer. It is unlikely that a "Standard" device, even though meeting the EASA requirements, will fully meet the aspirations of the customer. Such things as "type" specific switch and panel layouts, radio/navigation fits and aircraft performance are all easily achieved and at moderate cost so it is important to order the device that the Operator desires rather than accepting an "off the shelf" machine and then trying to change it later.

4.3 Apart from manufacturers lead times the main factor affecting the time taken to get the device qualified is the availability of the Technical Inspector for the QTG review ahead of the on-site evaluation and the evaluation team members for the on-site device evaluation. As soon as an Operator has a delivery date, even if it is provisional, an application form should be submitted and an evaluation date agreed, the three months mentioned at AMC1 ARA.FSTD.100 (a)(1), paragraph (b)(2) and AMC1 ORA.FSTD 200, Part A is realistic but, at times of peak demand, it could be longer!

4.4 The manufacturer will produce a QTG with preliminary results. The Operator may instruct the manufacturer to send this document directly to the Authority but it remains the Operators responsibility that it meets the requirements and may be submitted no less than 30 days before the date of intended evaluation. See AMC1 ARA.FSTD.100 (a)(1), paragraph (b)(2) .

4.5 By the time of the evaluation the Operator should have tested the device such that all parameters, especially those relating to performance, are acceptable to the Operator. Operators should not rely on the qualification evaluation to fine-tune the device or to be the final contractual acceptance test. AMC1 FSTD(A/H).300, Section (8),paragraph (i) refers.

4.6 The initial qualification visit will normally involve an Authority team of two, a Flight Inspector and a Technical Inspector, and will be scheduled to last a day and a half for a single configuration or two full days for a dual configuration device.

4.7 The flow charts infer that course approval cannot be obtained until after the device is qualified; in practice the two processes should be run in parallel so that the qualification and approval can be issued together.

4.8 Operators should note that the evaluation team will audit and assess the infrastructure and facilities of the organisation and especially the Compliance Monitoring Programme; Part 5 of this document refers (also AMC1/2 ORA.FSTD.100 and GM1 ORA.FSTD.100).

4.9 It is the Operators responsibility to apply for the annual recurrent qualification at least 60 days before the expiry of the Qualification (Part-ARA ARA.FSTD.120(b)(1), Part ORA ORA.FSTD.200(a)).

Part 5 Recurrent Qualification Checklist

The following checklist outlines the infrastructure required for qualification of a device.

- Who are the nominated Accountable Manager and Compliance Monitoring System Manager?
- Do the Management and Compliance Monitoring System adequately cover the specific requirements for FNPT/BITD qualification?
- Is the Training Accommodation adequate? (Briefing/planning rooms, classrooms, controlled access to simulator room etc.).
- Health and Safety; fire detectors and alarms, emergency lighting and signs, hazards. See Part ORA.FSTD.115.
- Maintenance organisation, maintenance schedules, tech. logs and records, Configuration Control System.

The following checklist gives an indication of the scope of the annual re-evaluation.

- Review of last evaluation report, what is still open and why?
- What software or hardware changes have been made since the last visit? Are they all logged in the Configuration Control System?
- Management and Compliance Monitoring System - review Audit reports – see below.
- Tech logs and Deferred Defects, review for trends and/or recurring entries.
- QTG – run progressively? Objective and Subjective? Any problems, if so what action is being taken? QTG results being analysed, who by? Does the CMP Manager cross check and counter-sign? Review a sample of results.
- Re-run a sample number of tests.

Management and Compliance Monitoring System (CMS):

Experience has shown that the CMS can be poorly addressed by the Operator and is evidenced during recurrent qualification visits. It is not enough to have a Management and CMS Manual, the evaluation team will need to see evidence of the system in use: -

- QTG records – objective tests should be run progressively through the year, the results must be stored and dated. Electronic storage of test results is recommended but there should also be a record of who ran the tests and a signature sheet for that person to acknowledge responsibility for running the tests and analysing the results. Some devices have an automatic test system, which indicates when a test result is out of tolerance; total reliance on such a system is not acceptable, each test should be thoroughly reviewed before being considered acceptable. There should be a parallel system where subjective fly-out dates are recorded and results signed for.
- The CMS Manager does not have to be present for the running of the QTG tests but he does have overall responsibility, there should therefore be evidence such as a counter-signature that he is happy that the tests have been run and analysed correctly.
- AMC1 ORA.FSTD.100, paragraph (c) outlines the scope of Quality Audits.
- GM1 ORA.FSTD.100, paragraph (v) details the action to be taken should an Audit find non-conformances. It is the responsibility of the CMS Manager that corrective action is taken and recorded.
- AMC1 ORA.FSTD.240, paragraph(2) lists the records that should be kept and demands that they should be retained for a period of 5 years.

It is very easy for the Management and CMS to become over complicated, over burdensome and to develop a life of their own. The ideal system would be simple to understand and revolve around people recording and signing for things that they should be doing anyway. If the evaluation team find that tests have been run incorrectly or that results have not been analysed such that faults have not been identified then this indicates several things:

1. The person running the tests needs more training and/or standardisation.
2. The CMS Manager isn't doing his job because he should have identified Item 1.
3. The Audit was inadequate because it should have identified Items 1 & 2 and raised a non-conformance report.

The net result is that instead of a simple comment about a rogue test result the team would have to raise its own non-conformance report due to the inadequacies of the Management and Compliance Monitoring System(CMS). It is worth noting here that the evaluation visit for the FSTD forms an integral part of the annual School Inspection and therefore any non-conformance is recorded on the overall assessment of the school.

The requirements of a CMS for a BITD are in AMC3 ORA.FSTD.100. Although the CMS required for a BITD needs to be less detailed than that for a FNPT the basic philosophy and format is the same.

In summary, the Management and Compliance Monitoring System Manual should define procedures and responsibilities; personnel should do what is required of them and sign for it; the CMS Manager should confirm that the job has been done correctly and the Audit should sample the whole paper trail to confirm the integrity of the system.

Part 6 Available Credits

6 The maximum "flying hours" in a qualified FNPT or BITD that can be credited against an approved course of flying training are shown in the relevant parts of Part-FCL 1 and 2.

6.1 It should be remembered that these hours are the maximum and require that the device is fully qualified and the course is fully approved. Some courses have a limit that is less than the maximum device limit; for example an FNPT II (A) maximum is 40 hours against an Integrated CPL/IR Course but a single engine modular IR course is limited to 35 hours. It is also possible that the Authority may reduce the credit hours that can be claimed on a specific course if it is felt that there are deficiencies in the syllabus or if there are too many differences between the device and the aircraft that is used for training, (discussed at 6.2 below).

6.2 This discussion is intended to inform the reader of the philosophy that has been used, and will be continued to be used, by the UK CAA in the evaluation of FNPTs.

It should always be borne in mind that the User approval of these devices is in the context of a structured course of training, whether integrated or modular, and that the device is used to substitute airborne time in an aircraft in the real time environment to meet the requirements for the issue of a Licence or Rating and therefore the device should represent the appropriate aircraft as closely as possible. The qualification of the device rests on its meeting the technical requirements as set out in CS- FSTD A/H as appropriate.

The device is not only intended as a vehicle for the transfer of training but more importantly as a means of transfer of behaviour. What do we mean by this?

A transfer of training is simply the teaching of a technique e.g. to fly an ILS approach in a fixed wing aircraft the student needs to be taught that the glide path is controlled by small adjustments to the attitude by use of the elevators, speed is controlled by power setting and that the aircraft should be trimmed for this configuration.

Transfer of behaviour includes the above plus the learned motor skills of finding the gear/flap selector without having to look for the appropriate control, selecting gear/flap at the appropriate stage of the approach, setting the power to a given manifold air pressure, torque, blade angle, engine pressure ratio, gas generator speed etc. In short how to operate the particular aircraft being used in training. We must always remember that the low hours student undertaking the courses

that these devices are approved for have little experience to fall back on and any variation between the device and the aircraft is a major stumbling block at this stage of their flying career.

The intention of allowing a FNPT to be “Generic” was always to simplify the construction and data gathering required to build the device rather than to manufacture something that did not represent a real aircraft, thus the acceptance of data gleaned from Pilot Operating Handbooks, manufacturers’ manuals and video/pencil & stopwatch in flight etc. In addition the cockpit may contain non-aircraft parts as long as the functionality represents that of the item being replicated.

Part-FCL 1 explicitly acknowledges, by the mandating of Differences Training within a given Class of aircraft, that there may be significant variations between aircraft in the same Class. It would be improper to ignore such variations when evaluating the use, in an approved course, of a FNPT. Thus, for example, where a device represents a normally aspirated piston engine aircraft and the aircraft used in the training course has turbo-charged engines although the device may be qualified it would be sensible to restrict the User approval to something less than the maximum credit allowed in order that the student may have greater exposure to the aircraft and therefore be effectively taught the differences between the device and the aircraft. There are numerous other examples, which might be considered given that the MEP (Land) Class encompasses everything from a simple aircraft like the BE76 Duchess to the Cessna 421 Golden Eagle series and nowadays the more modern DA42 with integrated FMS type displays and FADEC engine control etc.

The situation in the rotary arena although different has many similarities – simple aircraft in use in the early stages and complex medium weight twin engine helicopters required for IFR training.

Therefore Operators are encouraged to consider carefully how any FSTD will be integrated into a syllabus of training in order to maximise the chances of achieving the aims of the course in the most efficient manner. Reductions in the credit available are not to disadvantage the ATO but to try to ensure the quality of the student training is optimised within the constraints of the equipment available.

Appendix 1 to Standards Document 18 – Flowchart Guidance on Design and Qualification

FSTD OPERATOR is interested in FNPT for aircraft or class of aircraft

FSTD OPERATOR may also be **USER**

FSTD OPERATOR asks Competent Authority for relevant and procedures

AUTHORITY advises on providers of related documents and materials for information (CS-FSTDA/H, PART ORA)

FSTD OPERATOR becomes aware of documents, requirements etc. And selects level of suitable device for the training requirements

MANUFACTURER prepares a proposal concerning an aircraft or a class of aircraft. Sub-systems, cockpit layout, availability of flight test data, wind tunnel data, flight manual data, etc.

FSTD OPERATOR selects a manufacturer and initiates application process with the Competent Authority (minimum 3 months before evaluation) (See ORA.FSTD.200, AMC 1 (Part A) and GM)

FSTD OPERATOR and MANUFACTURER sign the purchase contract, which should include the related documents and materials for the qualification process of the device.

MANUFACTURER prepares device specification and QTG with information:

- Mathematical model for equations of motion
- Aerodynamic model and related source data
- Engine model and related source data
- Control feed system model
- Ground handling model
- System simulation
- Source of applied data for the above mentioned components i.e. flight test data (even simple stop watch/pencil or video data), flight manual, aeroplane manufacturers data (wind tunnel tests, certification flight test data etc.)
- Method of merging all information to the Validation Test Data

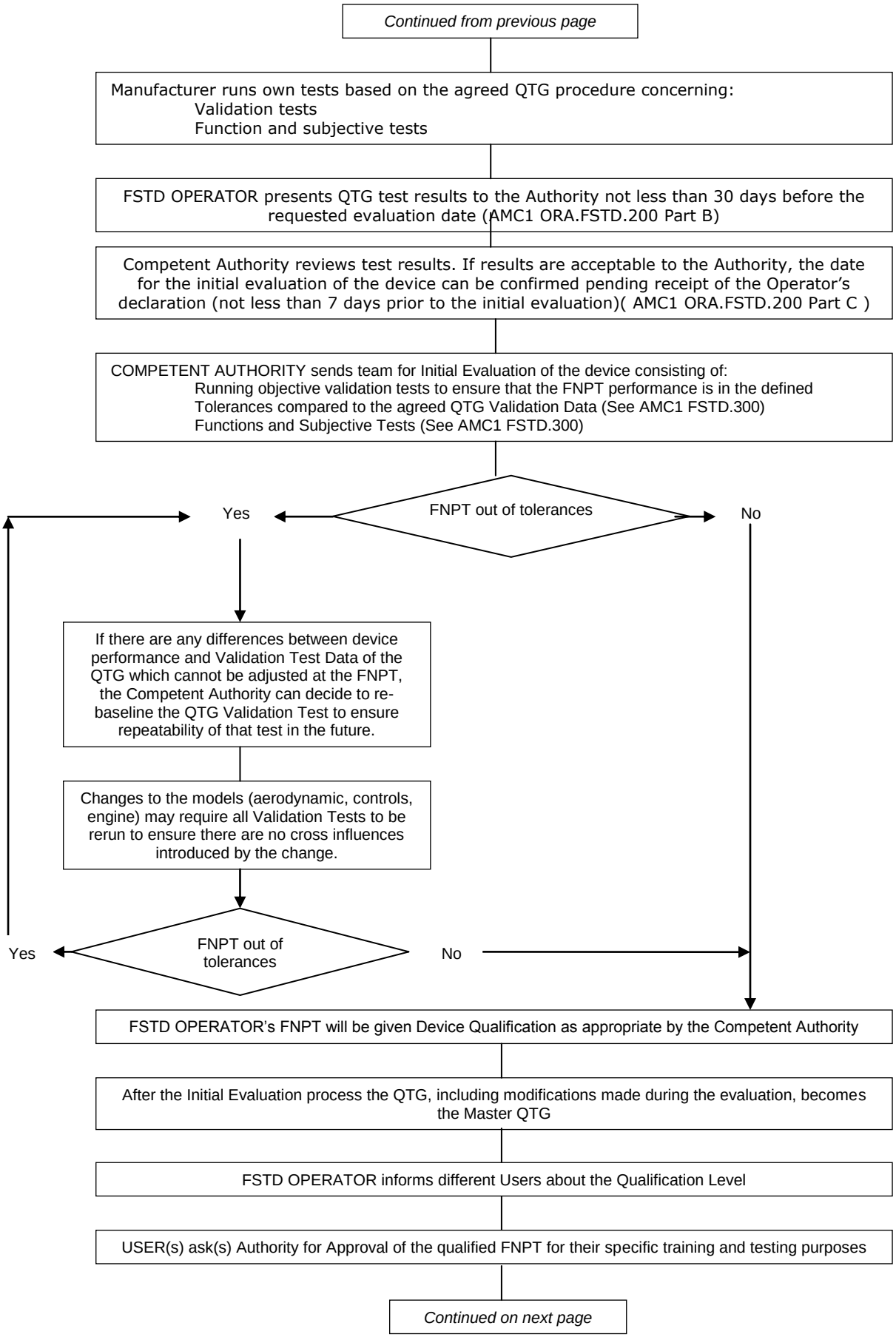
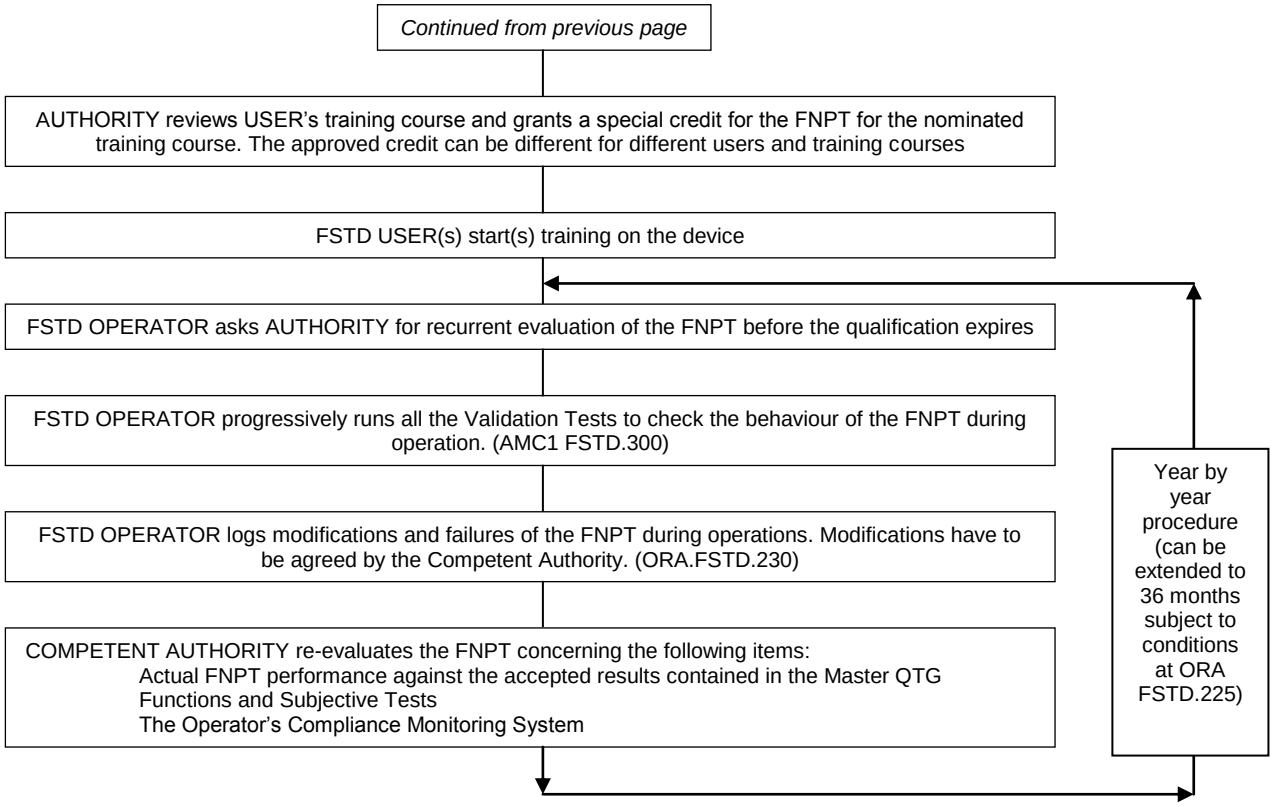
This is often referred to as the “Engineering Report” (See CS-FSTD(A) or CS-FSTD(H))

FSTD OPERATOR presents draft of QTG to the Competent Authority for discussion and final agreement

MANUFACTURER finishes device final integration process of the FNPT

Continued on next page

Appendix 1 to Standards Document 18 – Flowchart Guidance on Design and Qualification



Appendix 1 to Standards Document 18 – Flowchart Guidance on Design and Qualification