**SUBPART FSTD. REQUIREMENTS for ORGANISATIONS OPERATING FLIGHT SIMULATION TRAINING DEVICES and the QUALIFICATION of FSTDs**

 **SECTION I. REQUIREMENTS for ORGANISATIONS OPERATING FSTDS**

***AMC 1.* ORA. FSTD. 100 General**

 *COMPLIANCE MONITORING PROGRAMME – ORGANISATIONS OPERATING FSTDs*

***a )*** *Introduction.*

1 ) the purpose of this AMC is to provide additional and specific information to an organization operating FSTDs on how to establish a compliance monitoring programme ( CMP ) that enables compliance with the applicable requirements.

***b )*** *Compliance Monitoring Programme.*

1 ) typical subject areas for inspections are the following :

( i ) actual FSTD operation ;

( ii ) maintenance ;

( iii ) technical Standards ;

( iv ) FSTD safety features.

***c )*** *Audit Scope.*

1 ) organizations operating FSTDs are required to monitor compliance with the procedures they have designed to ensure specified performance and functions. In doing so they should as a minimum, and where appropriate, monitor the following :

( i ) organization ;

( ii ) plans and objectives ;

( iii ) maintenance procedures ;

( iv ) FSTD qualification level ;

( v ) supervision ;

( vi ) FSTD technical status ;

( vii ) manuals, logs and records ;

( viii ) defect deferral ;

( ix ) personnel training ;

( x ) aircraft modifications ;

( xi ) FSTD configuration management.

***AMC 2.* ORA. FSTD. 100 General**

 *COMPLIANCE MONITORING PROGRAMME – ORGANISATIONS OPERATING FSTDs*

One acceptable means of measuring FSTD performance is contained in ARINC report 433-1

( December 14, 2007 or as amended ) *Standard Measurements for Flight Simulation*

*Quality*.

***AMC 3.* ORA. FSTD. 100 General**

*COMPLIANCE MONITORING PROGRAMME – ORGANISATIONS OPERATING*

*BASIC INSTRUMENT TRAINING DEVICES ( BITDs )*

a ) The compliance monitoring programme together with a statement acknowledging completion of a periodic review by the accountable manager should include the following :

1 ) a maintenance facility that provides suitable BITD hardware and software test and maintenance capability ;

2 ) a recording system in the form of a technical log in which defects, deferred defects and development work are listed, interpreted, actioned and reviewed within a specified time scale ;

3 ) planned routine maintenance of the BITD and periodic running of the qualification test guide ( QTG ) with adequate manning to cover BITD operating periods and routine maintenance work.

b ) A planned audit schedule and a periodic review should be used to verify that corrective action was carried out and that it was effective. The auditor should have adequate knowledge of BITDs.

***GM 1.* ORA. FSTD. 100 General**

 *COMPLIANCE MONITORING – ORGANISATIONS OPERATING FSTDs – GENERAL*

a ) The concept of Compliance Monitoring ( CM ) is a fundamental requirement for

organizations operating FSTDs. An effective CM function is vitally important in supporting operation of the devices, in a structured way, to ensure they remain in compliance with the technical standards of CS-FSTD ( A ) and CS - FSTD ( H ) and continue to be effective training tools. An effective CM function is also essential to support any level of extended recurrent evaluation period as permitted by ORA. FSTD. 225( b ) ;

b ) The following guidance has been developed to provide additional material to help both

organizations operating FSTDs and competent authorities in developing effective CM that satisfy the applicable requirements and ensure the highest standards of training are maintained ;

c ) Additional GM provide a compliance checklist for organizations operating FSTDs ( GM 2.

ORA.FSTD.100 ) and guidance detailing the preparation for an evaluation by the GDCA

( GM3 ORA.FSTD.100 ). The compliance checklist should be used by the GDCA as a standardized checklist for the elements that are expected in the CM function of an organization operating FSTDs. The organization should complete as a minimum the second column of the checklist by providing appropriate manual or procedure references for each of the identified elements of the CM function. Additional information can be provided in the third column to aid assessment of the checklist as appropriate. This would then be provided to the GDCA. Use of this checklist should assist in ensuring a consistent approach by the GDCA and also provide organizations operating FSTDs with additional guidance on all the elements of a CM function that the GDCA will expect. The guidance is provided to help organizations operating FSTDs to prepare for authority visits ;

d ) The documentation of the CM may be electronic, provided the necessary controls can be demonstrated. This should include control of any paper copies that may be downloaded for use by individuals. It is recommended that any such copies are automatically designated as uncontrolled as part of the download process. Whilst electronic signatures on master documents may be accepted, with appropriate protections, a hardcopy master of the CM manual should be provided, with wet-ink signatures to be held by the applicant ;

e ) It should be recognized that whatever CM is developed, it will not be effective unless it becomes an integral part of the way in which the organization works. It includes both the necessary procedures for maintaining compliance with all the applicable requirements and a compliance monitoring programme ( CMP ) to monitor the execution of these procedures. A successful CM will ensure that the highest training tool is available at all times.

If the CM is viewed as an add-on to existing processes it will become a burden and it will never be wholly effective. It should also be noted that compliance control or inspection is only a small part of a CM.

If the CM is working effectively, inspections such as fly-outs should become routine revealing little beyond day-to-day unserviceabilities. Systematic defects should be captured by the CMP ;

f ) The GDCA should be satisfied that the accountable manager is able to adequately provide the required level of resources to properly support the FSTD. Detailed knowledge of FSTD requirement standards are not necessary, only sufficient to understand his / her responsibility for ensuring the FSTD is properly supported. The assessment of the compliance monitoring manager should concentrate on establishing that the nominee has sufficient knowledge and experience of both CM management and FSTD operations to operate a Compliance Monitoring System ( CMS ) within an organization operating FSTDs. This is likely to require experience of working in the compliance monitoring field and sufficient knowledge of FSTDs and the technical standards with which they should comply ;

g ) If an organization operating FSTDs is certified under any international quality standard it should assure that it fully covers the applicable organization requirements of Part - ORA

and the qualification basis ;

h ) For small organizations, it is perfectly acceptable to combine the roles of compliance

monitoring manager and accountable manager. For other organizations that hold multiple certificates and may cover multiple sites, it is advantageous to have a common CM function with an overall compliance monitoring manager. However, it is essential, particularly where sites may be significantly separated geographically, that there is a nominated representative at each site and possibly for each certificate. These representatives should hold the delegated responsibility of the CM manager for the day-to-day CM role at their site and in their function and have the necessary direct reporting line to the overall CM manager. It will also be necessary to ensure that local representatives are also acceptable to the local competent authority. In many cases the local representatives may perform other functions in addition to this role. This is acceptable provided the necessary independence of any compliance monitoring activity is maintained ;

i ) CM, as a whole, begins with the requirements with which the system seeks to comply.

These include both the technical standards, in this case the relevant parts of CS-FSTD(A)/(H)

plus any other specific standards, for example health and safety regulations, and the compliance monitoring objectives, such as defect rates and rectification intervals and FSTD reliability targets. The CM should define the process by which these standards are made available to those who require them ;

j ) The next part of CM is that part which defines the day-to-day procedures or working

practices by which the standards will be achieved. These procedures should include as a minimum defect reporting systems, defect rectification processes, tracking mechanisms, preventative maintenance programmes, spares handling, equipment calibration and configuration management of the device. They should include checks to assess the compliance of the performed actions. These procedures and standards should be made readily available to anybody involved in the maintenance and day-to-day operation of the FSTD ;

k ) The third part of CM is the method by which the organization operating an FSTD confirms the device is maintained in compliance with the defined standards and is being operated in accordance with the defined procedures.

This is the compliance monitoring programme ( CMP ) and includes the audit methods, reporting and corrective action procedures and feedback, management reviews and schedules for audits of all aspects of the FSTD operation ;

l ) Across all aspects of CM, and most important to it, are the people. CM includes the definition of the responsibilities of all staff and should include a declaration of the minimum levels of resource proposed for the direct support of the FSTD plus the levels of support and managerial staff proposed. The levels of resource can be affected by factors such as local health and safety regulations, existence of weekend and / or night usage of the device(s), etc.. CM also includes definition of the skills and experience required for staff and leads to definition of any required training programmes. Training needs cover both technical training and audit training, including QTG running and checking and fly-out techniques for flight crew;

m ) The documentation of CM may be provided in any number of documents provided there are appropriate cross-references in all documents such that the system is fully traceable in both directions from end to end. For all but small organizations at least two documents would be expected :

1 ) Firstly, a CM manual containing the policy, terminology, organizational charts and responsibilities, an overview of all processes, within the system, including those for maintaining regulatory compliance such as QTG running and fly-outs ( function and subjective testing ), CMP including the audit schedule and audit procedures including reporting and corrective action procedures. In addition, the CM manual should include, either directly or by reference, the identification of skills and experience and associated training ;

2 ) Secondly, a procedures manual containing, as a minimum, software and hardware control procedures, configuration control procedures including, for example, control of training loads, updates to visual models, navigation and instructor operation station ( IOS ) databases, QTG running and checking procedures, fly-out procedures, maintenance procedures including both defect rectification and preventative maintenance processes. Any standard forms and checklists should also be included.

n ) The CM documentation also includes all records such as technical logs, QTG runs, fly-out

reports and maintenance job cards ;

o ) For organizations with several certificates, separate and modular procedures manuals with a single CM manual covering all approvals, may be acceptable ;

p ) It is important to understand the difference between compliance assurance and compliance control. An effective CM will contain elements of both. Compliance control is normally done by inspection of the product ; it provides confirmation at the time of the inspection that the product conforms to a defined standard ;

q ) The compliance assurance element is essential to ensure the standard is maintained throughout the periods between product ( FSTD ) inspections. Within a CMP, the processes are defined that are necessary to provide confidence that the FSTD(s) is / are being supported and maintained to the highest possible standard and in compliance with the relevant requirements. A programme of internal audits is then set in place to confirm that the processes are being followed and are effective. The competent authority would normally oversee a certified organization by process and system audit, however, in the case of FSTDs, authority oversight includes an inspection element in the form of the recurrent FSTD evaluation ;

r ) In addition to the normal process and system audits, the compliance assurance audit schedule should include the schedule for each FSTD for fly-outs and QTG running through the audit year ;

s ) The audit procedure should include, at least, the following : statement of scope, planning, initiation of audit, collection of evidence, analysis, reporting of findings, identification and agreement of corrective actions and feedback, including reporting significant findings to the competent authority, where appropriate. The review of published material could include, in addition to the CM and procedures manuals, QTG records, fly-out reports, technical log sheets, maintenance records and configuration control records ;

t ) In addition to basic knowledge of FSTD requirements and operation, it is expected that auditors have received training in CM and audit techniques ;

u ) The routine fly-outs of the device are a specialized part of the audit programme. It is

essential that the pilots tasked with carrying out these fly-outs are adequately experienced. They would be expected to be type rating instructor / examiner ( TRI / TRE ) qualified on the type, and should have experience of simulator evaluations carried out by the GDCA.

The assignment of such pilots can present difficulties, particularly for the independent organization operating FSTDs not directly associated with an airline. It is vital for the organization to ensure their users are aware of the importance of the fly-outs as part of the continued qualification of the device and the need to assist in the provision of suitably qualified pilots to carry them out. It is worth noting that simulator users are required to satisfy themselves that the training devices they use are assessed for continued suitability, as part of their own CMP. Involvement in fly-outs assists in meeting this need ;

v ) Whilst it is accepted that the number of audits required in an organization with a single device will be significantly less than those in larger organizations with multiple devices, the CMP should still meet the same criteria, and cover all aspects of the operation within a 12 month period. The independence of the audit personnel should be maintained at all times.

The audit programme, whether by full audit or by using a checklist system should still be sufficiently comprehensive to provide the necessary level of confidence that the device is maintained and operated to the highest possible standard. This includes monitoring and review of corrective actions and feedback processes ;

w ) The successful use of sub-contractors who play a significant role in the provision of

services, such as maintenance or engineering services, to an organization operating FSTDs is reliant on the sub-contractor operating under the CM of the organization. All requirements that an organization is expected to meet are equally applicable to his / her sub-contractor. It is the organization’s responsibility to ensure that the subcontractor complies with its CM ;

x ) It is essential that a proper understanding of the CM and how it applies to each and every staff member is provided by appropriate training to all, not just those directly involved in operating the CM, such as the accountable manager, the CM manager, representatives and the auditors. The training given to those directly involved in CM should cover the CM, audit techniques and applicable technical standards. CM familiarization training should be an integral part of any induction training and recurrent training. Update training on technical standards for audit personnel, is also of particular importance ;

y ) Any effective CM will include measurement of its effectiveness. The organization should develop performance measures that can be monitored against objectives. Such measures, often referred to as metrics, should be reviewed by the GDCA as part of its oversight of the CM within the organization and during recurrent evaluations. In addition they should form part of the data reviewed during scheduled management reviews as part of the CM ;

z ) ARINC 433 provides good guidance on FSTD compliance measurement. Metrics should

monitor not only individual FSTD performance but, for larger organizations, how each FSTD is performing within the fleet. It is also recommended that metrics data be shared, regularly, with the FSTD manufacturers to allow monitoring for generic problems such as design issues, which may be best addressed with a fleet-wide solution.

***GM 2.* ORA. FSTD. 100 General**

*COMPLIANCE MONITORING – ASSESSMENT for ORGANISATIONS OPERATING FSTDs*

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|  **COMPLIANCE MONITORING ASSESSMENT**  **for ORGANISATIONS OPERATING FSTDs**  |
| **Organization :** |  |
| **Site Assessed :**  |  |
| **Date of Assessment :**  |  |
| **Accountable Manager :**  |  |
| **Compliance Monitoring Manager :** |  |
| **Number and Type of FSTDs :**  |  |
| **CM Manual Reference :**  |  |
|  |
|  ***Audit Area***  | ***CM / Proc. Ref***  | ***Comments*** | ***Satisfactory - Y / N*** |
| **1. ACCOUNTABLE MANAGER** ( AM ) |
| Has an AM with overall responsibility for Compliance Monitoring ( CM ) been nominated ?  |  |  |  |
| Does the AM have corporate authority to ensure all necessary activities can be financed and carried out to the standard required by the GDCA of RA ? |  |  |  |
| Has a formal written compliance policy statement been established, included in the CM Manual and signed by the AM ? |  |  |  |
| **2. COMPLIANCE MONITORING MANAGER**  |
| Has a CM Manager been nominated ?  |  |  |  |
| Are the posts of CM Manager and AM combined ? If so, is the independence of compliance audits assured?  |  |  |  |
| Does the CM Manager have overall responsibility and authority to : a) verify that standards are met ; *and* b) ensure that the compliance monitoring programme is established, implemented and maintained ?  |  |  |  |
| Does the CM Manager have direct access to the AM ?  |  |  |  |
| Does the CM Manager have access to all parts of the organization operating an FSTD and as necessary any sub-contractor’s organization ?  |  |  |  |

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|  ***Audit Area***  | ***CM / Proc. Ref***  | ***Comments*** | ***Satisfactory - Y / N*** |
| **3. COMPLIANCE MONITORING ( CM )**  |
| Has CM been established by the operator ?  |  |  |  |
| Is CM properly documented ? *( see Section 4 )*  |  |  |  |
| Is the CM structured according to the size and complexity of the operator ? |  |  |  |
| Does the CM include the following as a  minimum : a) monitoring of compliance with  required technical standards ; b) identification of corrective actions and  person responsible for rectification ; c) a feedback system to AM to ensure corrective action are promptly addressed ; d) reporting of significant non- compliances to the GDCA ; e) a compliance monitoring programme to verify continued compliance with applicable requirements, standards and procedures.  | a )b ) c )d )e ) |  |  |
| Are the responsibilities of the CM Manager defined to include, as a minimum : a) monitoring of corrective action  programme ; b) ensuring that the corrective actions  contain the necessary elements ; c) providing management with an  independent assessment of corrective  action, implementation and completion d) evaluation of the effectiveness of the  corrective action programme.  |  |  |  |
| Are adequate financial, material and human resources in place to support CM ?  |  |  |  |
| Are management evaluations / reviews of CM held at least quarterly ?  |  |  |  |
| Does the management evaluation ensure that the CMS is working effectively and is it comprehensive and well documented ?  |  |  |  |
| Does the CMP identify the processes necessary and the persons within the organization who have the training, experience, responsibility and authority to carry out the following : a) schedule and perform quality  inspections and audits, including  unscheduled audits when required ;  | a ) |  |  |

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|  ***Audit Area***  | ***CM / Proc. Ref***  | ***Comments*** | ***Satisfactory - Y / N*** |
| **3. COMPLIANCE MONITORING ( CM ) *- cont’d -*** |
| b) identify and record any concerns or  findings, and the evidence necessary to  substantiate such concerns or findings ; c) initiate or recommend solutions to  concerns or findings through designated  reporting channels ; d) verify the implementation of solutions  within specific timescales.  | b ) c )d ) |  |  |
| Is there sufficient auditor resource available and can their required level of independence be demonstrated ?  |  |  |  |
| Do the auditor’s report directly to the CM Manager ?  |  |  |  |
| Does the defined audit schedule cover the following areas, within each 12 month period ?a) organization ; b) plans and objectives ; c) maintenance procedures ; d) FSTD qualification level ; e) supervision ; f) FSTD technical status ;g) manuals, logs and records ; h) defect deferral ;i) personnel training ;j) aircraft and simulator configuration management, including AD. | a)b)c)d)e) f) g) h) i) j)  |  | *AD - Airworthiness*  *Directives.* |
| How are audit non-compliances recorded ?  |  |  |  |
| Are procedures in place to ensure that corrective actions are taken in response to findings ? |  |  |  |
| Are records of the CMP : a) accurate ;b) complete ; *and*c) readily accessible ?  | a)b)c) |  |  |
| Is there an acceptable and effective procedure for providing a briefing on the CM to all personnel ?  |  |  |  |
| Is there an acceptable and effective procedure for ensuring that all those responsible for managing the CM receive training covering : a) an introduction to the concept of the CM ; b) compliance management ;c) the concept of compliance assurance ;d) CM Manuals ;e) audit techniques ;f) reporting and recording ;g) how the CM supports continuous  improvement within the organization. | a)b)c)d)e) f) g)  |  |  |

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|  ***Audit Area***  | ***CM / Proc. Ref***  | ***Comments*** | ***Satisfactory - Y / N*** |
| **3. COMPLIANCE MONITORING ( CM ) *- cont’d -*** |
| Are suitable training records maintained ?  |  |  |  |
| Are activities within the CM subcontracted out to external agencies ? |  |  |  |
| Do written agreements exist between the organization and the sub - contractor clearly defining the services and standard to be provided ?  |  |  |  |
| Are the procedures in place to ensure that the necessary authorizations / approval when required are held by a subcontractor? |  |  |  |
| Are the procedures in place to establish that the sub-contractor has the necessary technical competence ?  |  |  |  |
|  **4. CM MANUAL**  |
| What is t he current status of the CM Manual – amendment and issue date ?  |  |  |  |
| Is there a procedure in place to control copies and the distribution of the CM Manual ?  |  |  |  |
| Is the CM manual signed by the AM and the CM Manager ?  |   |  |  |
| Does the CM Manual include, either directly or by reference to other documents, the following : a) a description of the organization ; b) reference to appropriate FSTD  technical standards ; c) allocation of duties and responsibilities ; d) audit procedures ;e) reporting procedures ;f) follow-up and corrective action  procedures ;g) document retention policy ;h) training records.  | a)b)c)d)e) f) g) h) |  |  |
| Is there a document retention policy covering : a) audit schedules ;b) inspection and audit reports ;c) responses to findings ;d) corrective action reports ;e) follow-up and closure reports ;f) management evaluation reports.  | a)b)c)d)e) f)  |  |  |
| Does the CM Manual include, either directly or by reference to other documents, the following procedures for day to day operation of the FSTD : a) defect reporting systems ;b) defect rectification processes ;c) tracking mechanisms ; | a)b)c) |  |  |

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|  ***Audit Area***  | ***CM / Proc. Ref***  | ***Comments*** | ***Satisfactory - Y / N*** |
| **4. CM MANUAL *- cont’d -*** |
| d) preventative maintenance programmes ; e) spares handling ;f) equipment calibration ;g) configuration management of the  device including visual, IOS and  navigation databases ; h) configuration control system to ensure  the continued integrity of the  hardware and software qualified ; i) QTG running and function and  subjective tests. | d)e) f)g)h)i) |  |  |
| Does the CM Manual include, either directly or by reference to other documents, procedures for notification of the GDCA of the following : a) any change in the organization  including company name, location,  management ; b) major changes to a qualified device ; c) deactivation or relocation of a  qualified device ; d) major failures of a qualified device ; e) major safety issue associated with the  installation.  | a)b)c)d)e)  |  |  |
| Does the CM Manual define acceptable and effective procedures to ensure compliance with applicable health and safety regulations, including : a) safety briefings ;b) fire /smoke detection and suppression ;c) protection against electrical,  mechanical, hydraulic and pneumatic  hazards ; d) other items as defined in AMC 1.  ORA. FSTD. 115  | a)b)c)d) |  |  |
| Does the CM Manual include acceptable and effective procedures for regularly checking FSTD safety features such as emergency stops and emergency lighting, and are such tests recorded ?  |  |  |  |

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|  ***Audit Area***  | ***CM / Proc. Ref***  | ***Comments*** | ***Satisfactory - Y / N*** |
| **5. COMPLIANCE MEASURES**  |
| Have CM objectives been developed from the policy statement, and included either directly or by reference in the CMS Manual ?  |  |  |  |
| Does the CMS include processes to produce and review appropriate metrics data ?  |   |  |  |
| Do these compliance measures track the following : a) FSTD availability ;b) numbers of defects ;c) open defects ;d) defect closure rates ;e) training session interrupt rates ;f) training session compliance rating.  | a)b)c)d)e) f)  |  |  |
| Do the compliance measures support the compliance objectives ?  |  |  |  |
|  |
| Required actions / Comments : |
|  Date : |  | *Signature* |  |

***GM 3.* ORA. FSTD. 100 General**

 *COMPLIANCE MONITORING SYSTEM – GUIDANCE for ORGANISATIONS OPERATING FSTDS to PREPARE for a COMPETENT AUTHORITY EVALUATION*

***a )*** *Introduction.*

 The following material provides guidance on what is expected by the competent authorities to support the discussion during the preliminary briefing, which is a first step of any initial or recurrent evaluation of an FSTD carried out by a competent authority.

This document has been developed as well to standardize working methods throughout States and to develop effective CM spot checks to satisfy the applicable requirements and therefore to ensure the highest standards of training are attained ;

***b )*** *Document Form.*

 Different document forms can be considered. Nevertheless, it appears that the best solution is a dossier, which includes all the information required by the competent authority to perform an evaluation ;

***c )*** *Contents of the Dossier for an Initial Evaluation :*

1 ) type of FSTD and qualification level requested ;

2 ) evaluation agenda : including date of evaluation, name of people involved for the competent authority, contact details for the FSTD Operator, schedules for the subjective flight profile, QTG rerun ;

3 ) FSTD identification and detailed technical specification including, type of FSTD, manufacturer, registration number, date of entry into service, host computer, visual system, motion system, type of IOS, simulated version(s), standards of all the aircraft computers, if applicable. Manuals needed for an evaluation *( e. g. flight manuals, system manuals, acceptance test manual, IOS user manual etc.., if applicable )* could already be provided as part of the dossier in an electronic format ;

4 ) planned modifications ;

5 ) subjective open defect(s) ;

6 ) airport visual databases including for each visual scene, name of the airport, IATA and ICAO codes, type of visual scene *( specific or generic ),* additional capabilities *( e. g. snow model, WGS 84 compliance, Enhanced Ground Proximity Warning System* ( EGPWS ) ) ;

7 ) QTG status : the list should include for each QTG test available the status of the tests following the FSTD Operator and competent authority reviews.

***d )*** *Contents of the Dossier for a Recurrent Evaluation :*

1 ) type of FSTD and qualification level requested ;

2 ) evaluation agenda, including date of evaluation, name of people involved for the competent authority, contact details for the Operator, schedules for the subjective flight profile, QTG rerun and QTG review ;

3 ) FSTD identification, including type of FSTD, manufacturer, registration number, date of entry into service, host computer, visual system, motion system, type of IOS, simulated version(s), standards of all the aircraft computers, if applicable ;

4 ) status of items raised during the last evaluation and date of closure ;

5 ) reliability data : training hours month by month during the past year, numbers of complaints mentioned in the technical log, training hours lost, availability rate ;

6 ) operational data : a list of FSTD users over the previous 12 months should be provided, with number of training hours ;

7 ) failure tabulation including categorization of failures *( by ATA chapter and Pareto diagram, ARINC classification ) ;*

8 ) details of main failures leading to training interruption or multiple occurrences of some failures ;

9 ) hardware and / or software updates or changes since last evaluation and planned hardware and / or software updates or changes ;

10 ) subjective open defect(s) ;

11 ) airport visual databases including for each visual scene, name of the airport, ATA and ICAO codes, type of visual scene *( specific or generic ),* additional capabilities ( snow model, WGS 84 compliance, EGPWS ) ;

12 ) QTG status : the list should include for each QTG test available, the date of run during the past year, any comment, and the status of the tests ; *and*

13 ) results of scheduled internal audits and additional quality inspections *( if any )* since last evaluation and a summary of actions taken.

***AMC 1.* ORA. FSTD. 110 Modifications**

 *GENERAL*

a ) The FSTD, where applicable, should be maintained in a configuration that accurately represents the aircraft being simulated. This may be a specific aircraft tail number or may be a representation of a common standard ;

b ) Users of the device should always establish a differences list for any device they intend to use, and to identify how any differences should be covered in training. In order to ensure each device is maintained in the appropriate configuration, the organization operating an FSTD should have a system that ensures that all relevant Airworthiness Directives ( ADs ) are introduced where applicable on affected FSTDs ;

c ) ADs from both the State of Design of the aircraft and the State where the FSTD is

located should be monitored. ADs from the State of Design of an aircraft are usually automatically applicable, unless specifically varied by the aircraft’s State of Registry ;

d ) Where appropriate, ADs issued by States where users of the device have aircraft registered should also be monitored. In addition to ADs, the FSTD operator should also put in place processes that ensure all aircraft modifications are reviewed for any effect on training, testing and checking. This can be achieved by reviewing the aircraft manufacturer’s service bulletins and may require a specific link to the aircraft manufacturer to be developed. In practice this link is often established through aircraft operators who use the device ;

e ) Organizations operating FSTDs should notify the competent authority of major changes ;

f ) This does not imply that the competent authority will always wish to directly evaluate

the change. The competent authority should be mindful of the potential burden placed on the organization by a special evaluation and should always consider that burden when deciding if such an evaluation is necessary ;

g ) The organization operating FSTDs should have an internal acceptance process for

modifications, to be used when implementing all modifications, even if the competent authority has made a decision to carry out an evaluation.

***GM 1.* ORA. FSTD. 110 Modifications**

 *EXAMPLES of MAJOR MODIFICATIONS*

The following are examples of modifications that should be considered as major.

This list is not exhaustive and modifications need to be classified on a case*-*by*-*case basis :

a ) any change that affects the QTG ;

b ) introduction of new standards of equipment such as Flight Management and Guidance

Computer (FMGC ) and updated aerodynamic data packages ;

c ) re-hosting of the FSTD software ;

d ) introduction of features that model new training scenarios ; e. g. Airborne Collision

Avoidance System ( ACAS ), EGPWS ;

e ) aircraft modifications that could affect the FSTD qualification ; *and*

f ) FSTD hardware or software modifications that could affect the handling qualities,

performance or system representation.

***AMC 1.*  ORA. FSTD. 115 Installations**

 *MINIMUM ELEMENTS for SAFE OPERATION*

*a ) Introduction.*

1 ) this AMC identifies those elements that are expected to be addressed, as a minimum, to ensure that the FSTD installation provides a safe environment for the users and operators of the FSTD under all circumstances.

*b ) Expected Elements.*

1 ) adequate fire / smoke detection, warning and suppression arrangements should be provided to ensure safe passage of personnel from the FSTD ;

2 ) adequate protection should be provided against electrical, mechanical, hydraulic and pneumatic hazards, including those arising from the control loading and motion systems, to ensure maximum safety of all persons in the vicinity of the FSTD ;

3 ) other areas that should be addressed include the following :

( i ) a two-way communication system that remains operational in the event of a total power failure ;

( ii ) emergency lighting ;

( iii ) escape exits and escape routes ;

( iv ) occupant restraints *( seats, seat belts etc.. )* ;

( v ) external warning of motion and access ramp or stairs activity ;

( vi ) danger area markings ;

( vii ) guard rails and gates ;

( viii ) motion and control loading emergency stop controls accessible from either pilot or instructor seats ;

( ix ) a manual or automatic electrical power isolation switch.

***GM 1.* ORA. FSTD. 115 Installations**

 *GENERAL*

a ) The intent of ORA. FSTD. 115 is to establish that the organization operating an FSTD has all the necessary procedures in place to ensure that the FSTD installation remains in compliance with all requirements affecting the safety of the device and its users ;

b ) Based on experience, the GDCA should pay particular attention to the quality of safety briefings on the FSTD provided to users and instructors, and to the execution of regular checks on the FSTD safety features ;

c ) It is recognized that certain checks, such as that of the emergency stop, can have adverse impact on the FSTD if carried out in full ;

d ) It is acceptable to develop a procedure that protects elements of the device by shutting them down in advance, in a more controlled manner, provided it can be shown that the procedure still demonstrates the whole device can be shut down by the operation of a single emergency stop button, when required.

**SECTION II. Requirements for the Qualification Of FSTDs**

***AMC 1.* ORA. FSTD. 200 Application for FSTD Qualification**

*LETTER of APPLICATION for INITIAL QUALIFICATION of an FSTD ;*

 *EXCEPT BASIC INSTRUMENT TRAINING DEVICE ( BITD )*

A sample of letter of application is provided overleaf.

 **Part A.**

To be submitted not less than 3 months prior to requested qualification date :

Date : \_ \_ / \_ \_ \_ \_ \_ \_ \_ / 20 \_ \_

Office : – GDCA of RA

Address : … … … … … … … … … … … … … … … … ….

City : … … … … … … … … …

Country : … … … … … … … … … … …

|  |  |  |
| --- | --- | --- |
|  **Type of FSTD** |  **Aircraft Type / Class** |  **Qualification Level Sought**  |
| ***Full Flight******Simulator FFS***  |  |  **A** |  **B** |  **C** |  **D** |  Sp / Cat |
| ***Flight Training******Device FTD***  |  |  **1**  |  **2**  |  **3**  |  - |  - |
| ***Flight and Navigation******Procedures Trainer*** ***FNPT***  |  |  **I**  |  **II**  |  **III**  |  II  MCC  |  III  MCC  |
|  |
|  Interim Qualification Level requested :  |  YES |  NO |

Dear, \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

 *Name of Applicant*

requests the evaluation of its Flight Simulation Training Device / FSTD / for qualification.

 \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

 *operator’s*  *identification of the FSTD*

The \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

 *FSTD manufacturer’s name*

FSTD with its visual system. \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

 *visual system and manufacturer’s name, if applicable*

Evaluation is requested for the following configurations and engine fits, as applicable :

*e. g. 320 CFM 56 / IAE 2500.*

1. . . . . . . . .

2. . . . . . . . .

3. . . . . . . . .

Dates requested are : \_ \_ / \_ \_ \_ \_ \_ \_ \_ \_ / 20 \_ \_

and the FSTD will be located at \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

 *place*

***The objective tests of the QTG will be submitted by*** \_ \_ / \_ \_ \_ \_ \_ \_ \_ \_ / 20 \_ \_

 *date*

 ***and in any event not less than 30 days before the requested evaluation date unless***

 ***otherwise agreed with the GDCA of RA.***

Comments : … … … … … … … … … … … … … … … … … … … … … … … … … … … …

… … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … …

… … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … …

… … … … … … … … … … … … … … … … … … … … … … … … … … …. … … … …. …

Signed … … … … … … … … … …

Print Name : … … … … … . . … … … … … … … … … … …

Position / appointment held : … … … … … .. … … … … … … … … … … …

Email address : … … … … … .. … … … … … … … … … … …

Telephone number : … … … … … ..

 **Part B.**

To be completed with attached QTG results.

Date : … … … … … … … … ….

We have completed tests of the FSTD and declare that it meets all applicable requirements except as noted below.

 The following QTG Tests still have to be provided :

|  |  |
| --- | --- |
|  ***Tests*** |  ***Comments***  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

*( Add boxes as required )*

It is expected that they will be completed and submitted 3 weeks prior to the evaluation date.

Signed … … … … … … … … …

Print name : … … … … … … … … … … … … … … … … …

Position / appointment held : … … … … … … … … … … … … … … … … …

E - mail address : … … … … … … … …

Telephone number : … … … … … ..

 **Part C.**

To be completed not less than 7 days prior to initial evaluation.

 Date : … … … … … … … … … .

The FSTD has been assessed by the following evaluation team :

 … … … … … … … .… … … … / … … … … … … … … … … … …

 Name Qualification

 … … … … … … … .… … … … / … … … … … … … … … … … …

 Name Qualification

… … … … … … … .… … … … / … … … … … … … … … … … …

 Name Qualification

… … … … … … … .… … … … / … … … … … … … … … … … …

 Name Pilot’s Licence N0

… … … … … … … .… … … … / … … … … … … … … … … … …

 Name Flight Engineer’s Licence N0  *( if applicable )*

**** **FFS / FTD :** This team attests that the \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ conforms to the aeroplane

 *type of FSTD*

flight deck / helicopter cockpit configuration of \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

 *name of aircraft operator ( if applicable )*,

 \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ aeroplane / helicopter within therequirements for \_ \_ \_ \_ \_ \_ \_ \_ \_

 *type of aeroplane / helicopter*   *type of FSTD and level*

and that the simulated systems and subsystems function equivalentlyto those in that aeroplane / helicopter. The pilot of this evaluation team has also assessed the performance and the flying qualities of the FSTD and finds that it represents the designated aeroplane / helicopter.

 **FNTP :** This team attest(s) that the \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ represents the flight deck or

 *aeroplane / helicopter or class of aeroplane / type of* *helicopter*

cockpit environment of a within the requirements for \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

 *type of FSTD and level*

and that the simulated systems appear to function as in the class of aeroplane / type of helicopter. The pilot of this evaluation team has also assessed the performance and the flying qualities of the FSTD and finds that it represents the designated class of aeroplane / type of helicopter.

*( Additional comments as required )* … … … … … … … … … … … … … … … …

 … … … … … … … .… … … … … … … … … … … … … … … … … … … …

 … … … .… … … … … … … … … … … … … … … … … … … … … … …. ... .

Signed : … … … … … … … … …

Print name : … … … … … . . … … … … … … … … … … … …

Position / appointment held : … … … … … . . … … … … … … … … … … … …

E - mail address : … … … … … … … … … … Telephone number : … … … … … ..

***GM 1.* ORA. FSTD. 200 Application for FSTD Qualification**

 *USE of FOOTPRINT TESTS in QUALIFICATION TEST SUBMISSION*

***a )*** *Introduction.*

1 ) Recent experience during initial qualification of some FFSs has required acceptance of increasing numbers of footprint tests. This is particularly true for FFSs of smaller or older aircraft types, where there may be a lack of aircraft flight test data. However, the large number of footprint tests offered in some QTGs has given rise to concern ;

2 ) This guidance is applicable to FFS aeroplane, FTD aeroplane, FFS helicopter and FTD helicopter qualifications.

***b )*** *Terminology.*

1 ) Footprint Test - footprint test data are derived from a subjective assessmentcarried out on the actual FSTD requiring qualification. The assessment andvalidation of these data are carried out by a pilot appointed by the GDCA. The resulting data are the footprint validation data for the FSTDconcerned.

***c )*** *Recommendation.*

1 ) It is permitted to use footprint data where flight test data is not available. Only when all other alternative possible sources of data have been thoroughly reviewed without success may a footprint test be acceptable, subject to a case-by-case review with the GDCA concerned, and taking into consideration the level of qualification sought for the FSTD ;

2 ) Footprint Test Data should be :

( i ) constructed with initial conditions and FFS set up in the appropriate configuration *( e. g. correct engine rating )*  for the required validation data ;

( ii ) a maneuver representative of the particular aircraft being simulated ;

( iii ) manually flown out by a type rated pilot who has current experience on type\* and is deemed acceptable by the GDCA \*\* ;

( iv ) constructed from validation data obtained from the footprint test maneuver and transformed into an automatic test ;

( v ) an automatic test run as a fully integrated test with pilot control inputs ; *and*

( vi ) automatically run for the initial qualification and recurrent evaluations.

\* *In this context, “ current “ refers to the pilot experience on the aircraft and not to the*

 *Part - FCL standards.*

\*\* *The same pilot should sign off the complete test as being fully representative.*

3 ) A clear rationale should be included in the QTG for each footprint test. These rationales should be added to and clearly recorded within the validation data roadmap ( VDR ) in accordance with and as defined in Appendix 2 to AMC 1 - CS-FSTD ( A ). 300 ;

4 ) Where the number of footprint tests is deemed by the GDCA to be excessive, the maximum level of qualification may be affected. The GDCA should review each area of validation test data where the use of footprint tests as the basis for the validation data is proposed. Consideration should be given to the extent to which footprint tests are used in any given area. For example, it would be unacceptable if all or the vast majority of take-off tests

were proposed as footprint tests, with little or no flight test data being presented. It should be recognized, therefore, that it may be necessary for new flight test data to be gathered if the use of footprint tests becomes excessive, not just overall, but also in specific areas ;

5 ) For recurrent evaluation purposes an essential match is to be expected. Validation tests using footprint data which do not provide an essential match should be justified to the satisfaction of the GDCA ;

6 ) The GDCA should be consulted at the point of definition of the aircraft data for qualification prior to the procurement of the device if footprint tests need to be used.

***AMC 1.* ORA. FSTD. 225 ( b )( 4 ) Duration and Continued Validity**

The assigned person should have experience in FSTDs and training. The person may have FSTD experience or training experience with an education in FSTD evaluation procedures only, provided the other element of expertise is available within the organization and a

procedure for undertaking the annual review and reporting to the GDCA is documented within the compliance monitoring function.

***AMC 1.* ORA. FSTD. 230 ( b ) Changes to the Qualified FSTD**

 *UPDATING and UPGRADING EXISTING FSTDs*

a ) An update is a result of a change to the existing device where it retains its existing qualification level. The change may be certified through a recurrent inspection or an extra inspection if deemed necessary by the GDCA according to the applicable requirements in effect at the time of initial qualification ;

b ) If such a change to an existing device would imply that the performance of the device

could no longer meet the requirements at the time of initial qualification, but that the result of the change would, in the opinion of the GDCA, clearly mean an improvement to the performance and training capabilities of the device altogether, then the GDCA might accept the proposed change as an update while allowing the device to retain its original qualification level ;

c ) An upgrade is defined as the raising of the qualification level of a device, or an increase in training credits, which can only be achieved by undergoing an initial qualification according to the latest applicable requirements ;

d ) As long as the qualification level of the device does not change, all changes made to the device should be considered to be updates pending approval by the GDCA ;

e ) An upgrade, and consequent initial qualification according to the latest applicable requirements, is only applicable when the organization requests another qualification level *( re-categorization ) f*or the FSTD.

***AMC 1.* ORA. FSTD. 240 Record - keeping**

 *FSTD RECORDS*

FSTD records to be kept should include the following :

1 ) for the lifetime of the device :

( i ) the master QTG ( MQTG ) of the initial evaluation ;

( ii ) the qualification certificate of the initial evaluation ; *and*

( iii ) the initial evaluation report.

2 ) for a period of *at least* ***5***  *years* *( in paper or electronic format )* :

( i ) recurrent QTG runs ;

( ii ) recurrent evaluation reports ;

( iii ) reports of internal functions and subjective testing ;

( iv ) technical log ;

( v ) CMS report ;

( vi ) audit schedule ;

( vii ) evaluation programme ;

( viii ) management evaluation reports ;

( ix ) obsolete procedures and forms.

 *INTENTIONALLY LEFT BLANK*