



Civil Aviation Authority of Singapore

Manual of Standards – Air Traffic Control Training Organisation

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Civil Aviation Authority of Singapore

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AMENDMENT RECORDS

The amendments listed below have been incorporated into this copy of the Manual of Standards – Air Traffic Control Training Organisation.

Amendment no.	Version no.	Subject	Source	Sections affected	Entered by (Date)	Approved by (Date)	Effective date
	1.0	Original version	-	All	SPL (1 Feb 2017)	Authority (26 Jan 2017)	1 Feb 2017

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CHAPTER 1 GENERAL

1.1 Introduction

- 1.1.1 This document, known as the Manual of Standards – Air Traffic Control Training Organisation (“MOS-ATCTO”), sets out the standards and requirements for a training organisation that conducts air traffic control training for persons who wish to be granted an air traffic controller licence issued by the Authority under paragraph 62A(2) of the Air Navigation Order (ANO).
- 1.1.2 A person, other than the Authority, must not provide any ATC training that leads to a Singapore air traffic controller licence unless he has obtained an approval from the Authority in accordance with the applicable requirements in the MOS-ATCTO.

1.2 Definitions

- 1.2.1 In this document, unless the context otherwise requires, the words have the meaning ascribed to them as follows –

Approved Training

Training conducted under special curricula and supervision approved by the DGCA.

Authorised Ground Examiner, AGE(ATC)

A person authorised by the Authority under paragraph 62A(3A)(b) of the ANO to conduct theoretical examinations or tests.

Competency

A combination of skills, knowledge and attitudes required to perform a task to the prescribed standard.

On-the-Job Training Instructor (OJTI)

An air traffic controller who satisfies the requirements stated under paragraph 3.1.3.3 of the MOS-PEL to conduct on-the-job-training (OJT) for a trainee in a live ATC environment.

CHAPTER 2 AIR TRAFFIC CONTROL TRAINING ORGANISATION

2.1 General

2.1.1 An ATCTO must be staffed, equipped, and operated in a suitable environment offering air traffic control training.

2.1.2 The ATCTO shall ensure that the following are established and maintained to the satisfaction of the Authority –

- (a) Organisational structure
- (b) Appointments of key personnel
- (c) Qualifications of instructors and key personnel
- (d) Facilities including but not limited to classrooms, simulators
- (e) Training programmes including but not limited to manuals, curricula, outlines, courseware
- (f) Procedures, manuals, and documentation
- (g) Quality Assurance system

2.1.3 The Director-General of Civil Aviation (“DGCA”) or a safety inspector may, at any time, for the purpose of ascertaining whether the course of training is being, or will be, carried out in a satisfactory manner or for any other purpose:

- (a) inspect the facilities;
- (b) observe the conduct of a course of training; or
- (c) inspect and copy any training records, technical logs, lecture, study notes, and briefings.

2.2 Application for an ATCTO Approval

2.2.1 An application for an ATCTO approval must be made in a form and manner prescribed by the DGCA.

2.2.2 The applicant must submit necessary manuals and documentation to support the Authority assessment of its compliance to Paragraph 2.1.

2.3 Issuance of the ATCTO Approval

- 2.3.1 The Authority may grant an approval under Paragraph 62A of the ANO to the ATCTO when the Authority has been satisfied that the ATCTO is complying and will continue to comply with the requirements contained in this document.
- 2.3.2 An ATCTO approval that is granted shall remain in force for a period of not more than one year, unless that period is varied, or the approval is suspended or revoked by the Authority.
- 2.3.3 The ATCTO approval will contain the following:
- (a) Name of Organisation
 - (b) Location
 - (c) Training course(s)
 - (d) Terms of approval
 - (e) Date of issue and period of validity

2.4 Renewal of the ATCTO Approval

- 2.4.1 The Authority may, upon being satisfied that the ATCTO continues to be able to comply with the requirements, renew an ATCTO approval for such period as it determines but shall not be more than one year.

2.5 Changes in the Scope of the Approval

- 2.5.1 Any changes that affect the scope of the approval, for example an inclusion of new training or an amendment to an existing training programme, shall be subjected to the Authority's approval prior to being implemented. The applicant must justify the request and provide the supporting information for assessment.

2.6 Revocation, Suspension or Variation of the Approval

- 2.6.1 The Authority may, under ANA Sections 4C and 4D, revoke, suspend or vary an approval if the requirements set out in this document cease to be met in part or in whole, or if the standards on which approval was granted are not maintained.

CHAPTER 3 OPERATIONS MANUAL (OPM)

3.1 Requirements for OPM

3.1.1 The ATCTO must provide and maintain an approved OPM for the use and guidance of personnel concerned, so that there may be clear guidance on the policy of the organisation as well as the procedures and processes which are used to provide training.

3.2 General Considerations

3.2.1 The contents of all operational documents, including the OPM, shall be consistent with each other and Human Factors principles. The manual must be used consistently across all departments within the organisation.

3.3 Contents

3.3.1 The OPM must include the following:

- (a) a general description of the scope of training authorised under the organisation's terms of approval;
- (b) the content of training programmes offered including the courseware and equipment to be used;
- (c) a description of the organisation's facilities;
- (d) the name, duties and qualification of the person designated as responsible for compliance with the requirements of the approval;
- (e) a description of the duties and qualification of the personnel designated as responsible for planning, performing and supervising the training;
- (f) a description of the procedures used to establish and maintain the competence of instructional personnel as required;
- (g) a description of the method used for the completion and retention of the training records as required;
- (h) a description, when applicable, of additional training needed to comply with an operator's procedures and requirements; and

- (i) a description of the selection, role and duties of the personnel within the ATCTO authorised by the Authority to conduct the testing required for the issuance of a licence or rating.

Note: Depending on the size and scope of training provided by the organisation, some of the elements above may be combined or subdivided further.

3.3.2 A suggested contents structure of an OPM for an ATCTO can be found in Appendix A.

3.3.3 A master index should be included at the beginning of the OPM for the ease of locating information.

3.4 Validation

3.4.1 The ATCTO must review and validate the OPM under realistic conditions before its use. The validation process must include using the critical aspects of the information contained in the manual to verify its effectiveness.

3.5 Amendment

3.5.1 The ATCTO must review the OPM at least once a year for accuracy and relevance, taking into account the following:

- (a) changes in the organisation's policies, procedures and practices;
- (b) changes in response to operating experience;
- (c) changes to the scope of training provided;
- (d) changes to the content of training programmes;
- (e) changes resulting from the installation introduction of new equipment;
- (f) changes to a document approved by the DGCA;
- (g) for the purpose of maintaining standardisation; and
- (h) changes to the regulations.

3.5.2 The ATCTO may implement a revision to the OPM only after it has been approved by the DGCA.

- 3.5.3 The ATCTO must have an effective system for the distribution and revision control of the OPM to ensure that all its personnel only refer to the current version of the OPM at all times.
- 3.5.4 Distribution of amendments and revisions must include a tracking system. The tracking system must include some form of log combined with a procedure to ensure that all amendments are furnished promptly to all organisations or persons to whom the manual has been issued.

CHAPTER 4 PERSONNEL

4.1 General

4.1.1 The ATCTO must employ, contract, or otherwise engage the following key personnel to plan, perform and supervise the training that it provides:

- (a) Accountable Manager
- (b) Head of Training
- (c) Instructors
- (d) Quality Manager

4.1.2 The ATCTO must obtain the DGCA's approval prior to the appointment of the persons referred to in paragraph 4.1.1.

4.2 Accountable Manager

4.2.1 The Accountable Manager will be responsible for:

- (a) ensuring that the ATCTO is in compliance with the requirements in MOS-ATCTO;
- (b) satisfying the DGCA that sufficient funding is available to conduct training to the approved standard; and
- (c) nominating the other key position holders in paragraph 4.1.1.

4.3 Head of Training

4.3.1 The Head of Training (HT) must have direct access to the Accountable Manager and the HT will be responsible for:

- (a) ensuring satisfactory training as well as supervising the progress of individual trainees;
- (b) monitoring staff standards and performance; and
- (c) catering sufficient resources to plan and perform the training course(s).

4.3.2 The HT must

- (a) hold or have held a valid air traffic controller licence;
- (b) be or have been an OJTI.

4.4 Instructors

4.4.1 The ATCTO must establish an instructor training and competency assessment programme to ensure that all instructors receive initial and continuation training in knowledge and skills appropriate to their assigned tasks and responsibilities. The programme is subject to acceptance by the DGCA, and must include

- (a) training in knowledge and skills related to human performance; and
- (b) competency assessment criteria.

4.4.2 The ATCTO may nominate a person for the DGCA's approval to be a Simulator Instructor only if the nominee:

- (a) holds a valid air traffic controller licence with current ratings;
- (b) has at least 7 years' experience in providing an air traffic control service;
- (c) has at least 5 years' experience in conducting on-job-training; and
- (d) has passed an annual competency check on his instructional skills conducted by the HT or his delegate.

4.4.3 The ATCTO may nominate a person for the DGCA's approval to be a Classroom Instructor only if the nominee:

- (a) holds or has held an appropriate licence or qualifications relevant to the subject being taught; and
- (b) has been assessed by the HT as appropriate for the subject.

4.5 Quality Manager

4.5.1 The Quality Manager will be responsible to the Accountable Manager for the implementation of the Quality Assurance System in Chapter 5 of this document.

4.5.2 The Quality Manager must:

- (a) have at least 2 years of experience in quality assurance; or
- (c) have attended a quality auditing course acceptable to the DGCA.

CHAPTER 5 QUALITY ASSURANCE SYSTEM

5.1 Purpose of a Quality Assurance System

5.1.1 The purpose of a quality assurance system is to ensure consistency in the training that complies with the standards set out in the ATCTO's manuals and the requirements prescribed by the DGCA, thus promoting continual improvement of the quality of training provided.

5.1.2 The ATCTO must establish standards, document procedures supporting such standards, plan activities, train personnel involved before implementing the documented procedures, and measure the outcomes of the activities to ensure that they meet standards and expected results. When non-compliance exists, corrective actions must be taken to improve processes and procedures.

5.2 Elements of a Quality Assurance System

5.2.1 The ATCTO must establish a quality assurance system which includes, as a minimum, the following elements:

- (a) organisation's training policy (for trainees and staff);
- (b) approval and maintenance of the Quality Manual;
- (c) training standards;
- (d) allocation of responsibility;
- (e) resources, organisation and operational processes;
- (f) system to ensure conformance of training with the policy and training standards;
- (g) system for identifying deviations from policy and standards and taking corrective action; and
- (h) evaluation and analysis of experiences and trends concerning policy, training standards, in order to provide feedback into the system for the continual improvement of the quality of training.

5.3 The Quality Assurance System of the ATCTO

- 5.3.1 The quality assurance system of the ATCTO is subject to the approval by the DGCA.
- 5.3.2 Any change or amendment to the quality assurance system manual shall require the acceptance of the DGCA.
- 5.3.3 Details on the contents of a quality assurance system for an ATCTO can be found in Appendix B of this document.

CHAPTER 6 FACILITIES

6.1 General

6.1.1 The ATCTO must have facilities appropriate to the size and scope of the intended operations to provide an environment conducive to learning. These include, as a minimum, the following:

- (a) facilities for instructors;
- (b) classrooms;
- (c) suitable demonstration equipment;
- (d) library; and
- (e) radio-telephony training and testing area (if appropriate).

6.1.2 The ATCTO must have, or have access to, the necessary information, equipment, training devices and material to conduct the courses for which it is approved.

6.2 Simulators

6.2.1 The use of simulators by the ATCTO to conduct training requires the prior approval of the Authority under Paragraph 62A(3A)(d) of the ANO.

6.2.2 The ATCTO must have sufficient number of approved simulators to provide continuity of training for the number of trainees attending the course.

6.2.3 The ATCTO must have in place measures to ensure reliability of the simulators to avoid disrupting the training of air traffic controllers.

CHAPTER 7 REQUIREMENTS FOR ENTRY TO TRAINING

- 7.1 The ATCTO must not accept a trainee for training leading to the issuance of an air traffic controller licence or rating unless the trainee:
- (a) satisfies the medical requirements to be an air traffic controller as specified in the ANO; and
 - (b) holds an offer of employment from, or is employed by, a Singapore air navigation service provider.

CHAPTER 8 RECORDS

8.1 Required Records and retention periods

8.1.1 The ATCTO must maintain detailed records on the following for the specified retention period:

Records	Retention period
trainee qualifications, training, and testing records in accordance with paragraph 8.2.1	perpetually
qualifications and training of instructional and examining staff, including records of instructors' recurrent training and competency checks	a minimum period of five years after instructor or examiner ceases to perform a function for the ATCTO
changes to key personnel (as specified in paragraph 4.1.1)	a minimum of five years after the change

8.1.2 The ATCTO must ensure that:

- (a) the records kept by the ATCTO are complete such that there will be sufficient documentary evidence for each training action, and for the reconstruction of the training history of each trainee or instructor in the organisation; and
- (b) the integrity of records is maintained. The ATCTO must ensure that the records are not removed or altered without authorization, and that there is a backup system of the records to provide continuity.

8.1.3 The ATCTO must also establish procedures acceptable to the DGCA on archiving records that are non-active.

8.1.4 The ATCTO must submit any records and reports to the DGCA when requested.

8.2 Training Records

8.2.1 The ATCTO must maintain a personal record for every trainee. The format of the trainee's personal records must be specified in the OPM and personal record must include:

- (a) personal particulars of the trainee;
- (b) a copy of the licence if applicable;
- (c) detailed records of training given to individual trainee, including but not limited to:
 - (i) for each simulator training session: the date; the exercises carried out; the instructor's name and written comments by the instructor on the trainee's performance;
 - (ii) progress tests, summary reports and the results of tests and examinations as required by the DGCA;

CHAPTER 9 EVALUATION AND CHECKING

9.1 Authorised Ground Examiner, AGE(ATC)

- 9.1.1 The ATCTO, which conducts theoretical knowledge training, must identify and maintain an adequate pool of AGE(ATC) for the development and administration of examinations which are to be taken by a trainee.
- 9.1.2 The ATCTO may nominate a person to be authorised by the DGCA as an AGE(ATC) only if the person:
- (a) has suitable experience instructing in the subject in which the examination questions would be set;
 - (b) has completed a course acceptable to the DGCA pertaining to the subject(s), of which the examination questions would be set; and
 - (c) has proficient skills in written English.
- 9.1.3 An AGE(ATC) may develop examination questions only on the subject for which they have been authorised for. The ATCTO may seek the DGCA's authorisation to extend the authorised scope of a AGE(ATC) by providing evidence of the AGE(ATC) having attaining the qualification for the proposed subject to be added.

9.2 Examinations

- 9.2.1 The ATCTO must seek the DGCA's acceptance of the question bank including security procedures for that examination.
- 9.2.2 The ATCTO must submit to the DGCA, at such time agreed with the DGCA before the examination, an examination timetable/schedule indicating the date(s) of the examinations. The ATCTO must inform the DGCA if there are any additional ad-hoc requests for examinations and/or re-sits not projected in the examination timetable/ schedule.
- 9.2.3 The ATCTO must ensure that an examination question prepared by an appropriately qualified AGE(ATC) is reviewed/vetted by another appropriately qualified AGE(ATC) before being incorporated into the question bank. The ATCTO must have in place a process to periodically refresh the examination questions and submit a copy of all newly produced examinations, with answers.

- 9.2.4 The ATCTO must ensure that an answer sheet marked by an appropriately qualified AGE(ATC) is verified and endorsed by another appropriately qualified AGE(ATC) before any result is finalised. A post examination analysis is required to determine if a gap in learning exists and if any ambiguity of the questions exists.
- 9.2.5 All examination results and answers sheets must be stored in accordance with the ATCTO's record retention system.

CHAPTER 10 TRAINING

10.1 Training Manual (TM)

10.1.1 The TM shall contain the detailed course syllabi that a trainee will undergo for ATC licence. It shall also state the standards, objectives and training goal for each phase of training that the trainee is required to comply with, including stating the entry requirements for each course, as applicable. It shall include the items found in Appendix C.

10.2 Training Programme

10.2.1 The ATCTO must develop a training programme covering all aspects of the course and obtain the Authority's approval for the programme prior to implementation. The programme shall include a breakdown of theory and simulator training in a week-by-week or phase presentation, a list of standard exercises, and a syllabus summary.

10.2.2 The ATCTO must conduct the training in accordance with the approved training programme. The ATCTO must obtain the Authority's approval for any changes to the approved training programme prior to implementing the changes.

10.3 Abridged Courses of Training

10.3.1 The ATCTO may conduct an abridged course of training for a trainee with previous air traffic control experience or other relevant credentials only if the Head of Training has:

- (a) assessed the trainee's suitability;
- (b) formulated an abridged syllabus; and
- (c) obtained an approval from the Authority accordingly for such an abridged course of training for that trainee.

10.4 Operational Publications

10.4.1 The following operational publications must be available to students and staff and, where applicable, kept current by amendments:

- (a) Air Navigation Order (ANO)

-
- (b) Aeronautical Information Publication and NOTAM including Aeronautical Information Circulars and AIP supplements
 - (c) Manual of Standards – Air Traffic Services (MOS-ATS), Manual of Standards – Licensing of Air Traffic Control Personnel (MOS-PEL), Manual of Standards – Air Traffic Control Training Organisation (MOS-ATCTO)
 - (d) Standard meteorology report and forecast documentation

CHAPTER 11 SPECIFIC REQUIREMENTS FOR TRAINING IN A LIVE ENVIRONMENT

11.1 Applicability

11.1.1 The provisions of this Chapter apply in the conduct of training in a live air traffic control environment.

11.2 Additional requirements on personnel

11.2.1 Head of Training

11.2.1.1 The ATCTO must not conduct ATC training in a live air traffic control environment unless the HT of the ATCTO holds a valid air traffic controller licence in addition to requirements specified in paragraph 4.3.2.

11.2.2 On-the-job-training instructor (OJTI)

11.2.2.1 The ATCTO must ensure that an instructor conducting on-the-job-training in a live air traffic control environment meets the requirements of an OJTI stated under paragraph 3.1.3.3 of the MOS-PEL.

11.3 Safety Management System

11.3.1 The ATCTO who conducts ATC training in a live air traffic control environment must establish an acceptable Safety Management System in accordance with the SMS requirements in Chapter Two of the MOS-ATS.

11.4 Medical Fitness

11.4.1 The ATCTO shall not permit a trainee air traffic controller to receive instruction in an operational environment unless the trainee air traffic controller holds a current Class 3 Medical Assessment.

APPENDIX A

CONTENTS OF THE OPERATIONS MANUAL

The Operations Manual must include the following elements as far as they are appropriate to the type of the training to be provided.

A1 General

- (a) Preamble relating to use and authority of the manual;
- (b) Table of contents;
- (c) Amendment, revision and distribution of the manual;
 - procedures for amendment
 - amendment record page;
 - distribution list; and
 - list of effective pages;
- (d) Glossary of significant terms and definitions;
- (e) Description of the structure and layout of the manual, including:
 - various parts, sections, their contents and use; and
 - the paragraph numbering system.
- (f) Description of the scope of training authorised under the organisation's terms of approval
- (g) Organisation (chart of the management organisation)
- (h) Qualifications, responsibilities and succession of command of management and key operational personnel, including but not limited to:
 - Accountable Manager;
 - Head of Training;
 - Instructors; and
 - Quality Manager.
- (i) Description of the facilities available, including:
 - the number and size of classrooms;
 - training aids provided; and
 - simulators, if any.

A2 Staff Training

- (a) Persons responsible for standards and competency of instructional personnel;
- (b) Details of the procedures to determine competency of instructional personnel;
- (c) Details of the training program for instructional personnel;
- (d) Procedures for proficiency checks and upgrade training.

A3 Training Plan for Each Course

- (a) Aim of the course in the form of a statement of what the student/ trainee is expected to do as a result of the training, the level of performance, and the training constraints observed;
- (b) Pre-entry requirements, including:
 - medical requirements; and
 - employment requirements.
- (c) Training curricula, including:
 - theoretical knowledge curriculum; and
 - simulator training curriculum, if applicable.
- (d) The general arrangements of daily and weekly programmes for training;
- (e) Training policies in terms of:
 - maximum student/ trainee training times, per day/ week/ month;
 - restrictions in respect of training periods for students/ trainees;
- (f) Policy for the conduct of student/ trainee evaluation, including:
 - procedures for progress checks and theory examinations;
 - procedures for authorisation for tests;
 - procedures for refresher training before retest;
 - test reports and records;
 - procedures for test preparation, type of questions and assessments, and standards required for a pass; and
 - procedures for question analysis and review and issuing replacement examinations.

- (g) Policy regarding training effectiveness, including:
- individual student/ trainee responsibilities;
 - liaison procedures between training departments;
 - procedures to correct unsatisfactory progress;
 - procedures for changing instructors;
 - internal feedback system for detecting training deficiencies;
 - procedures for suspending a student/ trainee from training; and
 - requirements for reporting and documentation.

A4 Tests and Checks Conducted for the Issuance of a Licence or a Rating

When an ATCTO has been approved the Authority to conduct the testing required for the issuance of a licence or rating in accordance with the OPM, it shall include:

- (a) name of the personnel with testing authority and scope of the authority;
- (b) role and duties of the authorised personnel;
- (c) if the school has been given authority to appoint personnel to conduct the testing required for the issuance of a licence or rating, the minimum requirement for appointment as well as the selection and appointment procedure; and
- (d) applicable requirements such as:
- procedures to be followed in the conduct of checks and tests; and
 - methods for completion and retention of testing records as required.

A5 Records

Policy and Procedures regarding:

- (a) Attendance records;
- (b) Trainee training records;
- (c) Staff training and qualification records;
- (d) Person responsible for checking records and trainee personal logs;
- (e) Nature and frequency of record checks;
- (f) Standardisation of record entries; and

(g) Security of records and documents.

A6 Appendices

Sample progress test forms, test reports and records, a copy of the ATCTO authorising document, as required.

APPENDIX B

THE QUALITY ASSURANCE SYSTEM OF THE ATCTO

B1 Quality Assurance Policy and Strategy

- B1.1 The ATCTO shall describe how the organisation formulates, deploys, and reviews its policy and strategy and turns it into plans and actions applicable to all levels of the organisation. A formal written quality policy statement shall be established that is a commitment by the Accountable Manager of the ATCTO, as to what the quality assurance system is intended to achieve. The quality policy shall reflect the achievement and continued compliance with any additional standards specified by the ATCTO.
- B1.2 The Accountable Manager shall have overall responsibility for the quality assurance system including the frequency, format and structure of the internal management review and analysis activities and may delegate the functions and tasks, to a quality manager.

B2 Quality Manager

- B2.1 The primary role of the quality manager is to verify, by monitoring activities in the field of training, the standards as established by the ATCTO and any additional requirements by the DGCA are being carried out properly.
- B2.2 The quality manager shall be responsible for ensuring that the quality assurance system is properly implemented, maintained and continuously reviewed and improved.
- B2.3 The quality manager shall have:
- (a) direct access to the accountable manager; and
 - (b) access to all parts of the ATCTO's organisation.
- B2.4 The quality manager shall be responsible for ensuring that personnel training relating to the quality assurance system is conducted.

B3 Quality Assurance System

- B3.1 The quality assurance system of the ATCTO shall ensure compliance with requirements, conformance to standards and adequacy of training activities conducted.

B3.2 Every process that assists the ATCTO to achieve its results shall be identified and the activities and procedures documented.

B3.3 The ATCTO shall specify the basic structure of the quality assurance system applicable to all training activities conducted.

B4 Feedback System

B4.1 The quality assurance system shall include a feedback system to ensure that corrective actions are both identified and promptly addressed. The feedback system shall also specify who is required to rectify discrepancies and non-conformance in each particular case, and the procedure to be followed if corrective action is not completed within an appropriate timescale.

B5 Documentation

B5.1 The ATCTO shall have a quality manual approved by the DGCA that includes the following:

- (a) quality policy;
- (b) terminology;
- (c) specified training standards;
- (d) a description of the organisation;
- (e) the allocation of duties and responsibilities; and
- (f) training procedures to ensure regulatory compliance.

B5.2 The quality assurance audit programme documentation shall reflect:

- (a) schedule of the monitoring process;
- (b) audit procedures;
- (c) reporting procedures;
- (d) follow-up and corrective action procedures;
- (e) recording system; and
- (f) document control.

B6 Quality Assurance Audit Programme

B6.1 The quality assurance audit programme shall include all planned and systematic actions necessary to provide confidence that all training are conducted in accordance with all applicable requirements, standards and procedures.

B7 Quality Inspection

B7.1 The primary purpose of a quality inspection is to observe a particular event/ action/ document etc, in order to verify whether established training procedures and requirements are followed during the accomplishment of that event and whether the required standard is achieved.

B7.2 The subject areas for quality inspections shall include, as a minimum, the following:

- (a) theoretical training;
- (b) simulator training, if applicable;
- (c) technical standards; and
- (d) training standards.

B8 Audit

B8.1 An audit is a systematic, and independent comparison of the way in which a training is being conducted against the way in which the published training procedures say it shall be conducted.

B8.2 Audits must include at least the following quality procedures and processes:

- (a) an explanation of the scope of the audit;
- (b) planning and preparation;
- (c) gathering and recording evidence; and
- (d) analysis of the evidence.

- B8.3 The various techniques that make up an effective audit are:
- (a) interviews or discussions with personnel;
 - (b) a review of published documents;
 - (c) the examination of an adequate sample of records;
 - (d) the witnessing of the activities which make up the training; and
 - (e) the preservation of documents and the recording of observations.

B9 Auditors

- B9.1 The ATCTO shall decide, depending on the complexity of the training, whether to make use of a dedicated audit team or a single auditor. In any event, the auditor or audit team shall have relevant training and/or operational experience.
- B9.2 The responsibilities of the auditors shall be clearly defined in the relevant documentation.

B10 Auditor's Independence

- B10.1 Auditors must not have any day-to-day involvement in the area of the operation or maintenance activity that is to be audited. An ATCTO may, in addition to using the services of full-time dedicated personnel belonging to a separate quality department, undertake the monitoring of specific areas or activities by the use of part-time auditors.
- B10.2 An ATCTO whose structure and size does not justify the establishment of full-time auditors, may undertake the audit function by the use of part-time personnel from within its own organisation or from an external source under the terms of an agreement acceptable to DGCA.
- B10.3 In all cases the ATCTO must develop suitable procedures to ensure that persons directly responsible for the activities to be audited are not selected as part of the auditing team. Where external auditors are used, it is essential that any external specialist is familiar with the type of training conducted by the ATCTO.

- B10.4 The quality assurance audit programme of the ATCTO must identify the persons within the company who have the experience, responsibility and authority to:
- (a) perform quality inspections and audits as part of ongoing quality assurance;
 - (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 time scales; and
 - (e) report directly to the quality manager.

B11 Audit Scheduling

- B11.1 A quality assurance audit programme must include a defined audit schedule and a periodic review cycle. The schedule must be flexible, and allow unscheduled audits when negative trends are identified. Follow-up audits are to be scheduled when necessary to verify that corrective action was carried out and that it was effective.
- B11.2 An ATCTO must establish a schedule of audits to be completed during a specific calendar period. All aspects of the training shall be reviewed within a period of twelve months in accordance with the programme.
- B11.3 When an ATCTO defines the audit schedule, significant changes to the management, organisation, training, or technologies shall be considered, as well as changes to the standards and requirements.

B12 Monitoring and Corrective Action

- B12.1 The aim of monitoring within the quality system is primarily to investigate and judge its effectiveness and thereby to ensure that defined policy and training standards are continuously complied with. Monitoring and corrective action functions fall under the responsibilities of the quality manager. Monitoring activity is based upon quality inspections, audits, corrective action and follow-up. The ATCTO shall establish and publish a quality procedure to monitor compliance with requirements and conformance to standards on a continuing basis. This monitoring activity shall be aimed at eliminating the causes of unsatisfactory performance.

- B12.2 Any non-conformance identified must be communicated to the manager responsible for taking corrective action or, if appropriate, the head of the ATCTO (i.e. accountable manager). Such non-conformance shall be recorded, for the purpose of further investigation, in order to determine the cause and to enable the recommendation of appropriate corrective and preventive action.
- B12.3 The quality assurance audit programme must include procedures to ensure that corrective and preventive actions are developed in response to findings. These quality procedures shall monitor such actions to verify their effectiveness and that they have been completed. Organisational responsibility and accountability for the implementation of corrective action resides with the department where the finding was identified. The head of the ATCTO (accountable manager) shall have the ultimate responsibility for ensuring, through the quality manager, that corrective action has re-established conformance with the required standards and any additional requirements specified by the DGCA.
- B12.4 The ATCTO must identify internal and external customers, and monitor their satisfaction by measuring and analysis of feedback.

B13 Management Review and Analysis

- B13.1 Management must accomplish a comprehensive, systematic documented review and analysis of the quality assurance system, training policies, and procedures, and must consider:
- (a) the results of quality inspections, audits and any other indicators;
 - (b) the overall effectiveness of the management organisation in achieving stated objectives; and
 - (c) correcting trends, and preventing, where applicable, future non-conformities.
- B13.2 Conclusions and recommendations made as a result of the review and analysis must be submitted in writing to the responsible manager for action. The responsible manager must be an individual who has the authority to resolve issues and take action. The head of the ATCTO must decide upon the frequency, format, and structure of internal review and critical analysis meetings.

B14 Recording

- B14.1 Accurate, complete and readily accessible records documenting the result of the quality assurance audit programme must be maintained by the ATCTO. Records are essential data to enable an ATCTO to analyse and determine the root causes of non-conformity, so that areas of non-compliance can be identified and subsequently addressed.
- B14.2 The following records must be retained for at least 3 years:
- (a) audit schedules;
 - (b) quality inspection and audit reports;
 - (c) responses to findings;
 - (d) corrective and preventive action reports;
 - (e) follow-up and closure reports; and
 - (f) management review and analysis reports.

B15 Quality Assurance System Training

- B15.1 Correct and thorough training is essential to optimise quality in every organisation. In order to achieve significant outcomes of such training, the ATCTO must ensure that all staff understands the objectives as laid down in the quality manual.
- B15.2 Those responsible for managing the quality assurance system must receive training covering:
- (a) concept of quality assurance and associated systems;
 - (b) quality management;
 - (c) quality manuals;
 - (d) audit techniques; and
 - (e) reporting and recording.

B16 The Functioning of the Quality System in the ATCTO

- B16.1 Time must be provided to train every individual involved in quality assurance and to brief the remainder of the employees. The allocation of time and resources will be governed by the size and complexity of the operation concerned.

B17 Sources of Personnel Training

- B17.1 Quality assurance courses are available from the various national or international standards institutions, and an ATCTO shall consider whether to offer such courses to those likely to be involved in the management of the quality assurance system. Organisations with sufficient appropriately qualified staff shall consider the possibility of carrying out in-house training.

APPENDIX C CONTENTS OF THE TRAINING MANUAL

A Training Manual for use at an ATCTO conducting approved courses must contain the following information:

C1 Training Plan

Aim of the Course	<ul style="list-style-type: none">• A statement of what the student is expected to be able to do as a result of the training, the level of performance to be achieved and the training constraints to be observed.
Pre-entry Requirements	<ul style="list-style-type: none">• Medical requirements, if applicable• Employment requirements
Abridged Courses	<ul style="list-style-type: none">• Credits for previous experience
Training Syllabi	<ul style="list-style-type: none">• The Theoretical Knowledge Syllabus (learning objectives)• The Simulator Training Syllabus (if applicable)
The Schedule and Incorporation of Syllabi	<ul style="list-style-type: none">• Projected schedule of the course incorporating all the syllabi.• Arrangement of daily and weekly programmes training.
Training Policies	<ul style="list-style-type: none">• Programme constraints in terms of maximum student training times per day/ week/ month.
Student Evaluation	<ul style="list-style-type: none">• Procedures for progress checks and tests• Test reports and records including passes, partial passes and failed attempts• Procedures for authorisation/recommendation for tests• Procedures for refresher training before retest• Test reports and records• Procedures for test preparation, type of questions and assessments and standards required for a pass• Procedures for question analysis and review and issuing replacement exams (if applicable)• Knowledge test re-sit procedures (if applicable)

Training Effectiveness	<ul style="list-style-type: none">• Individual student responsibilities• Liaison procedures between training departments• Identification of unsatisfactory progress (individual students)• Procedures to correct unsatisfactory progress• Procedures for changing instructors• Maximum number of instructor changes per students• Internal feedback system for detecting training deficiencies• Procedures for suspending a student from training• Discipline• Requirements for reporting and documentation• General assessment and completion standards at various stages of training to ensure standardisation
Standards and Standardisation	<ul style="list-style-type: none">• Individual responsibilities• Level of performance at various stages• Standardisation requirements and procedures• Application of test criteria
C2 Briefing and Exercises	
Exercise Specification	<ul style="list-style-type: none">• A detailed statement of the content specifications of all the exercises to be taught, arranged in sequential order with main and sub-titles.
Exercise Reference List	<ul style="list-style-type: none">• Lesson reference list in the form of an abbreviated list of the above exercises giving only main and sub-titles for quick reference in a form to facilitate daily use by instructors.
Course Structure Phases of Training	<ul style="list-style-type: none">• A statement of how the course shall be divided into phases, indicating how they shall be arranged to ensure that completion in the most suitable learning sequences and that essential or emergency exercises are repeated at the proper frequency.• State the syllabus hours for each phase and for groups of exercises within each phase and when progress tests are to be conducted.
Course Structure Incorporation of Syllabi	<ul style="list-style-type: none">• State the manner in which different modes of training shall be incorporated so that as the simulator training exercises are carried out students shall be able to apply the knowledge gained from the associated ground instruction.

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| Student Progress Requirement | <ul style="list-style-type: none">• State the ATCTO requirement in this respect and include a brief but specific statement of what a student is expected to be able to do, and the standard of proficiency required before progressing from one phase of training to the next. Include minimum experience requirements in terms of hours, satisfactory exercise completion etc, as necessary before the commencement of significant exercises such as night flying. |
| Instructional Methods | <ul style="list-style-type: none">• State the ATCTO requirements for instructional methods particularly with respect to briefings, adherence to syllabi and training specifications etc. |
| Progress Tests | <ul style="list-style-type: none">• State the instructions given to examining staff with respect to the conduct and documentation of all progress tests. |
| Glossary of Terms | <ul style="list-style-type: none">• Define significant terms as necessary. |
| Appendices | <ul style="list-style-type: none">• Progress test report forms• Qualifying test report forms• ATCTO certificates of experience, competence etc, as required |

C3 Simulator Training

The syllabus for simulator training shall be structured generally as in paragraph C2 of this Appendix.

C4 Theoretical Knowledge Instruction

The syllabus for theoretical knowledge instruction shall be structured generally as in paragraph C2 of this Appendix but with a training specification and objectives for each subject. Individual lesson plans shall include mention of the specific training aids available for use.