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Guidelines for the Competence Assessment of Air Traffic Safety Electronics Personnel

EUROPEAN AIR TRAFFIC MANAGEMENT

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Abstract

This document has been developed to support Member States introducing a competence assessment scheme to satisfy the requirements of EUROCONTROL Safety Regulatory Requirement 5 (ESARR 5) (see EUROCONTROL, 2002). The document proposes a harmonised approach to Basic Training, Qualification Training and System/Equipment Rating Training for Air Traffic Safety Electronics Personnel (ATSEP). It also proposes formal training for instructors and Competence Assessors (CAs) and describes competence assessment schemes for ATSEP, On-Site Training Instructors (OSTIs) and CAs.

The document emphasises the importance of human factors / TRM training for ATSEP and also examines safety and language issues.

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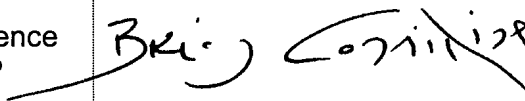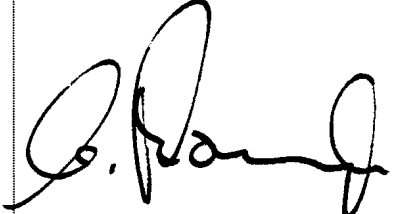| ELECTRONIC SOURCE		
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DOCUMENT APPROVAL

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CONTENTS

EXECUTIVE SUMMARY

This document has been developed by EUROCONTROL to provide guidance to National Supervisory Authorities (NSAs), Operating Organisations and individual personnel on the competence assessment of Air Traffic Safety Electronics Personnel (ATSEP).

The document supports the implementation of EUROCONTROL Safety Regulatory Requirement 5 (ESARR 5) (see EUROCONTROL, 2002) requirements on the competence of ATSEP when carrying out safety-related tasks in the ATM operational environment.

The document covers the training assessment processes used at Training Centres and Institutes for the Initial Training of ATSEP and at operational units during System/Equipment Rating Training.

The document also provides detailed recommendations and guidelines to assist Operating Organisations when assessing ongoing competence of ATSEP at operational units.

This document recommends that the training of ATSEP and assessment of competence in safety-related tasks at operational units are carried out by On-Site Training Instructors (OSTIs) and Competence Assessors (CAs) respectively. Guidance is provided in the document on the training and competence assessment of ATSEP in these roles.

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1. INTRODUCTION

1.1 Background

In October 2004 EUROCONTROL facilitated a workshop in Brussels on ATM Engineer and Technical Personnel Competence with the objective of providing better awareness of ESARR 5 and its implications for ATM safety regulators, Air Navigation Service Providers (ANSPs), professional associations, etc. Feedback from delegates clearly showed that there are no agreed and/or harmonised means of compliance with the ESARR 5 safety requirements.

Subsequently, and in line with its responsibilities in the field of safety management, EUROCONTROL was approached by several Member States to provide guidance material to facilitate a harmonised implementation of ESARR 5 requirements for engineers and technical personnel across the European Civil Aviation Conference (ECAC) Member States.

The primary aim of developing harmonised competence guidelines for engineers and technical personnel is to ensure safety, as far as reasonably possible, when they carry out safety-related tasks in the ATM operational environment.

The guidelines within this document are designed to satisfy the safety requirements of ESARR 5 and the European Commission Regulation on Common Requirements for the Provision of Air Navigation Services (ANS) as they apply to engineers and technical personnel.

EUROCONTROL has published three guideline training documents for ATSEP:

- Guidelines for a Common Basic Level of Technical Training for Air Traffic Safety Electronics Personnel (EUROCONTROL, 2004b – T2, Ed. 2.0);

- Guidelines for a Common Qualification Level of Technical Training for Air Traffic Safety Electronics Personnel (EUROCONTROL, 2003 - T32);

- Guidelines for a Common System/Equipment Rating Training for Air Traffic Safety Electronics Personnel (EUROCONTROL, 2006a – T43).

ICAO in 2004 published internally a Training Manual for ATSEP that provides detailed information on the role and training of personnel involved in the installation and maintenance of Communication, Navigation, Surveillance / Air Traffic Management (CNS/ATM) systems.

For consistency, this EUROCONTROL document uses the term 'Air Traffic Safety Electronics Personnel (ATSEP)' when referring to engineers and technical personnel.

It is fully appreciated that many Operating Organisations already have competence assessment schemes well established in their units and that they have committed considerable resources to achieve this. It could be the case that some of the procedures described herein could be useful for these Operating Organisations in the future. The guidelines are mainly directed towards Operating Organisations that do not have formal competence assessment schemes in place.

1.2 Scope

The scope of this document includes information and guidance on the processes to determine ATSEP competence. The document, for completeness, briefly describes ATSEP Initial Training and System/Equipment Rating Training and details the assessment processes associated with this training. The document also covers the assessment process for the maintenance of competence of ATSEP carrying out safety-related tasks on operational systems and equipment, Continuation and Refresher Training and assessment and Development Training. The document concludes with the training and competence assessment of On-Site Training Instructors (OSTIs) and a new role in ATM engineering, the Competence Assessor (CA).

1.3 Terminology

The acronym ATSEP in this document should be read as Air Traffic Safety Electronics 'Personnel' or 'Person' depending on the context.

Other than when taking direct quotations from ESARR 5 the term National Supervisory Authority (NSA) is used in place of the State Designated Authority or Regulator.

In order to be consistent with other EUROCONTROL documents on ATSEP training, this document uses the term On-Site Training (OST) and not the ICAO term On-the-Job Training (OJT). The reason for this difference is that the European view is that OJT implies training on "live" operational systems and equipment. However, ATSEP operational training is normally carried out on "off-line" systems and equipment and therefore OST is a more appropriate term. It is appreciated that the training for the System Monitoring and Control (SMC) will be considered OJT.

1.4 Assessment – Training and Competence

ESARR 5 states that a NSA shall ensure, through the application of appropriate regulatory principles and processes, that organisations and personnel responsible for tasks in the provision of air traffic services or supporting the provision of air traffic services, which are considered to be related to the safety of air traffic, are competent to carry out these tasks.

The purpose of competence assessment is to affirm competence and to identify areas in need of improvement as appropriate either in the individual or the system within which the individual works.

Initial Training of ATSEP is normally carried out at Training Centres/Institutes. The progress of learners during their Initial Training should be measured by training objectives developed by the Training Centres/Institutes.

Training of ATSEP at operational units and ongoing competence on the unit's systems/equipment should be measured by performance objectives developed by the units.

1.5 Competence Assessment Schemes

An Operating Organisation is any organisation which falls within the jurisdiction of a NSA and is responsible for the provision of engineering and technical services supporting ATM services. An ATM Service Provider could also be an Operating Organisation when it provides its own technical support.

Operating Organisations are responsible for ensuring that all their operational units have a documented unit competence assessment scheme. The unit competence assessment scheme plays an important role in the safety culture within the operational environment and is a process by which a NSA assures itself that ATSEP involved in ATM operational safety-related tasks are competent.

A unit competence assessment scheme documents the processes and procedures used at the operational unit to ensure ATSEP ongoing competence.

Unit competence assessment schemes should be fully documented and include the following information:

- roles and responsibilities of staff involved in assessing ATSEP ongoing competence;

- the process for assessing ongoing ATSEP competence;

- the process for the selection and training of the unit competence assessors

- the process for recording ATSEP ongoing competence;

- the process for maintaining ATSEP competence records; and

- the process for the review of the unit's local competence assessment scheme.

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2. EUROPEAN SAFETY REGULATION REQUIREMENTS FOR ATSEP

ESARR 5 includes specific safety requirements for engineers and technical personnel (ATSEP). Compliance with these regulations became mandatory for EUROCONTROL Member States in April 2005. All ECAC Member States are encouraged to comply with ESARR 5.

The overall safety objective of ESARR 5 is to ensure competency, and, where applicable, the satisfaction of medical requirements, of ATM services personnel responsible for safety-related tasks within the provision of ATM services.

The safety regulatory requirements of ESARR 5 that relate to ATSEP are synopsised below.

The requirements for engineers and technical personnel undertaking safety-related tasks apply to:

- *Civil designated authorities, operating organisations and individual personnel, ensuring services for ATM equipment approved for operational use*

- *Military authorities and their personnel ensuring services for ATM equipment approved for operational use in a mixed civil-military environment, except where an equivalent military regulatory framework exists.*

The main corpus of ESARR 5 concentrates on Safety Requirements and these are divided into General Requirements, which are applicable to designated authorities, service providers and individuals, specific requirements for air traffic controllers and specific requirements for engineers and technical personnel undertaking operational safety-related tasks.

The requirements for engineers and technical personnel undertaking operational safety-related tasks are specified for the Designated Authority, the Service Provider and the Individual and are synopsised as follows:

Requirements for the Designated Authority

- *To issue appropriate safety regulations*

- *To ensure adequate and appropriate safety regulatory oversight*

- *To take appropriate regulatory action if these regulations are not being met*

- *To verify that methods are in place to ensure third party individuals meet the applicable provisions*

Requirements for the Operating Organisation

- *To ensure personnel are properly trained and qualified*

- *To ensure personnel have and maintain sufficient knowledge of the ATM service and the appropriate working limits*

- *To maintain records*

- *To ensure physical or mental condition of personnel is appropriate for the tasks*

- *To ensure that individuals meet the provisions of ESARR 5*

- *To report to the Designated Authority all safety events*

- *To ensure that evidence exists of the qualifications and competence of personnel*

Requirements for Individual Personnel

- *To comply with requirements to ensure current and ongoing competence*

- *To comply with additional conditions applied by the Designated Authority*

- *To not undertake safety-related tasks if physical or mental condition renders them unfit*

- *To ensure that they have sufficient knowledge of the ATM service they are supporting and the working limits to be applied*

- *To systematically and consistently report safety occurrences*

- *To initiate appropriate remedial measures as appropriate*

Note: ESARR 5 does not propose a specific system to ensure these requirements such as a "licence" or a "certificate of competence" for ATSEP undertaking operational safety-related tasks. This decision is the prerogative of individual Member States.

3.   GLOSSARY

For the purposes of this document the following definitions shall apply:

Assessment: The procedure by which the professional qualities currently being demonstrated by a learner are determined. In some cases consistency may be a requirement and the attributes may be assessed individually or in their entirety. In other words, the overall quality of the work is being judged.

Attitude: The feelings and opinions concerning the job and other people, as well as personal conduct/responsibility.

Competence: Taken to mean possession of the required level of knowledge, skills, experience and where required, proficiency in English, to permit the safe and efficient provision of ATM services.

Examination: An in-depth inspection of a person's knowledge. It is a highly formalised test for a qualification using written and/or oral questioning.

Learner: The generic term for the person performing a learning activity without any reference to his/her statute.

Competence Assessor (CA): The person who is responsible for determining that ATSEP at a unit are competent and remain competent in carrying out ATM operational safety-related tasks.

On-site Training (OST): The integration in practice of previously acquired job related routines and skills under the supervision of a qualified On-site Training Instructor (OSTI)

Mentored Training: During the whole rating training process, and in particular during the OST phase, the ATSEP is under the guidance of qualified ATSEPs. The mentors can be instructors or experienced colleagues.

On-site Training Instructor (OSTI): A term used to describe an instructor whose role depends on instructional objectives and the instructional problem to be resolved. This role can be lecturing, reviewing, guiding and consulting.

Performance Evaluation: Testing of a learner to determine whether training/performance objectives have been achieved.

Performance Objective: A clear and unambiguous statement of what a learner is expected to do (performance) with the minimum level of acceptable performance (standard) and the conditions under which the performance is to be carried out

Training Objective: An objective developed by training organisations to measure the progress of learners during their training. The objective will

always include an action verb to ensure that the outcome is observable and that the difficulty level is defined according to a defined taxonomy.

4. ATSEP SUBJECT TO COMPETENCE ASSESSMENT

ATSEP learners when attending Initial Training at Training Centres/Institutes will be subject to assessment and/or examinations to determine their knowledge and performance skill levels.

ATSEP learners posted to operational ATS units will receive on-site training (both knowledge and practical skills training) on the unit's operational systems and equipment. In order to be able to work unsupervised on safety-related tasks at the unit, ATSEP learners will need to be assessed on their system/equipment knowledge and performance skills.

Conversion Training is a type of training designed to provide knowledge and skills appropriate to a change in either job category (new discipline or new System/ Equipment Rating), environment (new maintenance or procedures) or system (system upgrade or change of system, or new project). ATSEP receiving conversion training will be subject to competence assessment on job category changes, environment changes and system changes.

ATSEP during their operational careers may require development training to become OSTIs or to take up positions in System, Monitoring and Control (SMC). Again, competence assessment in these new skills and on maintaining these skills will be required.

ATSEP carrying out safety-related tasks at operational units will be subject to ongoing competence assessment to ensure they are maintaining competence.

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5. COMPETENCE, LANGUAGE PROFICIENCY, SAFETY, HUMAN FACTORS MEDICAL FITNESS AND MEASURING PERFORMANCE

5.1 Competence

ESARR 5 requires an Operating Organisation to 'ensure that ATSEP are properly trained and qualified to perform the assigned tasks and to ensure that ATSEP:

(a) have and maintain sufficient knowledge to ensure a sound understanding of the ATM service(s) they are supporting, and the actual and potential effects of their work on the safety of these service(s); and

(b) have and maintain sufficient knowledge of the appropriate working limits to be applied when performing safety-related tasks'.

ESARR 5 describes competence as 'possession of the required level of knowledge, skills, experience and where required, proficiency in English, to permit the safe provision of ATM services'.

A competent ATSEP therefore, is a person who has been provided with appropriate training to enable him to have the requisite knowledge and practical skills to operate and maintain ATM equipment approved for operational use.

Note: ESARR 5 states that ATM equipment in this context is not intended to cover other equipment related functions, such as design, testing, commissioning and institutional testing.

An Operating Organisation will need to satisfy itself that the ATSEP has reached the appropriate competence level at the end of any training associated with the operation and maintenance of ATM equipment. In order to do this, the ATSEP's knowledge and skill performance will need to be tested and evaluated.

It is important that an ATSEP's ongoing competence is checked throughout his operational career. Operating Organisations should therefore, have in place Unit Competence Assessment Schemes to ensure that ATSEP working on ATM equipment approved for operational use are assessed for competence at least every three years.

In order to maintain competence ATSEP should be provided with 'Continuation Training'. Such training includes:

- **Refresher training** designed to review, reinforce and upgrade existing knowledge and skills, including team skills;

- **Degraded systems training** designed to include training in unusual situations, in degraded systems and if suitable, in emergencies. Most of

this training will be site specific, or may make use of incidents or accident analysis; and

▪ **Conversion training** designed to provide knowledge and skills appropriate to a change in a job category, environment or system.

The Operating Organisations should also ensure that ATSEP remain in current practise at operating and installing the ATM equipment they are qualified on.

The National Supervisory Authority (NSA) will verify that from a safety viewpoint appropriate methods are in place to ensure that third party individuals assigned to operational safety-related tasks meet the applicable provisions.

Operating Organisations are required to ensure that evidence exists, and is provided to the NSA as required, of the qualification and competence of engineering and technical personnel to perform their operational safety-related tasks.

Before allowing contractors to carry out safety-related operational tasks, Operating Organisations should satisfy themselves on the qualifications and experience of the contractor's personnel and of the contracting company's safety and quality assurance processes.

5.2 Language Proficiency

ESARR 5 requires an ATSEP, where required, to be proficient in English. An example of when proficiency in speaking English would be necessary is when there is a need for an Organisation's ATSEP to communicate across international boundaries on ATM operational equipment matters. An example of proficiency in reading English is when there is a need for an Operating Organisation's ATSEP to read and comprehend technical documentation in English on ATM equipment supplied by foreign manufacturers. In such circumstances the Operating Organisation may need to have in place English language proficiency testing as part of the ATSEP competence scheme.

5.3 Safety

ESARR 3, 'Use of Safety Management Systems by ATM Service Providers' (EUROCONTROL, 2000), when referring to "safety responsibility", states that everyone involved in the safety aspects of ATM service-provision has an individual safety responsibility for their own actions.

It is very important, therefore, that ATSEP understand that, throughout their training and operational working careers, safety of themselves and their working colleagues and the potential effects of their work on the safety of the ATM service(s) they are supporting are paramount in their work. Competence in this important area should be tested and checked by the Operating Organisation throughout an ATSEP's operational career.

In supporting the highest principles of safety management Operating Organisations should consider the inclusion of a module on "Just Culture" in the training of ATSEPs. The benefits that can be gained from the creation of a Just Culture in an organisation include measurable effects such as increased event reports and corrective actions taken as well as intangible organisational and managerial benefits.

5.4 Human Factors

Lapses in human performance are cited as causal factors in the majority of aviation accidents and therefore ATSEP must be trained and tested in human factors and how they impact on ATM operational technical and engineering tasks.

It is recommended that Operating Organisations include human factors in Initial Training. The human factors training could be based on the ICAO (2004) Training Manual for ATSEP. This document contains a human factors module with the following topics:

- introduction to human factors,
- working knowledge and skills,
- psychological factors,
- medical,
- organisations and social factors,
- communication,
- stress,
- human error,
- working methods.

Once qualified on ATM operational equipment it is important that Operating Organisations continue to check throughout an ATSEP's operational career that he understands the importance of human factors and how they affect his operational tasks, particularly working as team members in the operational environment. To facilitate this Operating Organisations would be expected to include Team Resource Management (TRM) training in their continuation training programmes.

5.5 Medical Fitness

ATSEP should be made aware of the safety requirement in ESARR 5 'not to undertake safety-related tasks if they know or suspect that their physical or mental condition renders them unfit to undertake such tasks'. Operating Organisations may feel it necessary to provide their ATSEP with guidance and medical advice to enable them to decide as to whether they are fit to perform safety-related tasks.

Some European States already have in place regular specialised medical examinations for ATSEP who carry out safety-related tasks. Perhaps appropriate harmonised medical guidelines should be developed for those ATSEP carrying out safety-related tasks.

5.6 Measuring Performance

Performance evaluation (testing) is an integral part of the training process. Testing has many advantages for the learner as a means of learning. It provides incentive and motivation, and confirms learning. The advantage for the instructor is confirmation that the training/performance objectives have been met and if instruction methods or processes need to be improved. Tests should always be prepared with the sole purpose of measuring whether or not a learner has achieved the training/performance objective.

Learners must always be informed as to how they are going to be evaluated, so they can orientate their efforts. The information must include:

- the conditions that will exist during a test,
- the performance that is expected from the learner,
- the standards of accomplishment that must be met,
- the consequences of inadequate performance.

Learners must be informed of the result of their evaluation.

Time and resource constraints may limit the amount of testing that can be given to each training/performance objective, However, the criticality of the subject and the performance difficulties that can be encountered should give some indication as to when, how and what performance evaluation should be required. To summarise, performance measurement is undertaken to evaluate whether or not the learners have understood and assimilated the material taught, to the desired level.

The methods used for testing are described below:

- Skills are best assessed by performance tests, i.e. the learner performs the task described in the objective, under real or simulated conditions;

- Knowledge is best assessed by oral or written tests; and

- Attitudes are the feelings and opinions concerning the job, and other people, as well as personal conduct and responsibility. They are best assessed by observations of performance, or by means of questionnaires.

6. INITIAL TRAINING COMPETENCE ASSESSMENT

6.1 Introduction

Initial Training for an ATSEP includes 'Basic Training' and 'Qualification Training'.

Basic Training is designed to provide the prerequisite knowledge needed in order to prepare for Qualification Training and provides an overview of the overall CNS/ATM technical and operational environment, as well as an overview of the most important systems and equipment, and the role of the operations within this complex environment.

Qualification Training is designed to provide knowledge, skills and attitudes appropriate to the discipline ATSEP will follow in the CNS/ATM working environment. The disciplines are:

- Communication (COM),
- Navigation (NAV),
- Surveillance (SUR), and
- Data Processing (DP).

Following the completion of Basic Training the ATSEP will be trained in one of these specialised disciplines. The ATSEP may receive the training for more than one discipline. This training phase is important for the ATSEP because it makes the link between the general knowledge received in Basic Training and the specific equipment knowledge and skills required for the System/Equipment Rating Training. In Qualification Training, the knowledge, skills and attitudes needed for each of the disciplines is developed and applicability emphasised. System aspects of the personnel and of the equipment/systems are covered for each discipline.

6.2 Initial Training Performance Evaluation

Initial Training courses should provide ATSEP with the necessary knowledge and skills to a level of competence that will prepare them for System/Equipment Rating Training. Initial Training courses should at least satisfy the objectives in the current editions of:

a) EATM "Guidelines for a Common Basic Level of Technical Training for Air Traffic Safety Electronics Personnel" (EUROCONTROL, 2004b – T2, Ed. 2.0); and

b) EATM "Guidelines for a Common Qualification Level of Technical Training for Air Traffic Safety Electronics Personnel" (EUROCONTROL, 2003 – T32).

The Initial Training course for ATSEP should be fully documented indicating:

- the objectives of the training course;

- the training processes by which the training objectives will be met;

- the process by which progress and ultimate success will be judged, i.e. the performance evaluation process; and

- how the training course objectives meet the objectives of the EATM guideline documents detailed above.

Performance evaluation procedures should ensure that learners are kept aware of their progress on the training courses including any areas where improvement is required and the goals that must be achieved to successfully complete the course.

Objective levels 1 and 2 in the EATM guideline document syllabuses would normally be tested orally or by written tests. Level 3 and above would normally be tested by performance tests.

7.   SYSTEM/EQUIPMENT RATING TRAINING COMPETENCE ASSESSMENT

7.1   Introduction

After completing Basic Training and Qualification Training, ATSEP must have specific training on operational equipment and the equipment environment. ATSEP having received the training and assessed as being competent on a specific system or equipment are then rated on the system or equipment.

7.2   Rating Training Performance Evaluation

System/Equipment Rating training is frequently composed of modules that can be taught at a specialised training centre, at the factory or more usual, at an operational site. However, at least the On-site Training (OST) portion of the training dealing with the environment and logistic support must be carried out at the operational site.

System/Equipment Rating training courses should be designed in three parts:

- an environmental knowledge section on the equipment or system,
- a theoretical section on the equipment or system, and
- a practical section enhanced by OST on the equipment or system.

The level of training should be done up to the Lowest Replaceable Module (LRM) or electronic boards of the system/equipment. The repair of these modules or boards is not taken into account, and if necessary should be done through a specific training session.

At the end of the System/Equipment Rating training course the learner will be able to perform some of the principle duties of the ATSEP:

- Performing maintenance on CNS/ATM system/equipment which include:

    1) Calibrating flight and ground radio navigation aids;
    2) Certification of CNS/ATM system/equipment;
    3) Modification of operational CNS/ATM equipment;
    4) Preventative maintenance;
    5) Corrective maintenance.

- Performing installation of CNS/ATM system/equipment.

- Management, monitoring and control of operational CNS/ATM system/equipment.

- Developing, reviewing and modifying CNS/TM system/equipment, and/or maintenance procedures and standards.

The testing of objectives associated with the environmental knowledge and theoretical sections of System/Equipment Rating training courses would normally be tested orally or by written tests.

The purpose of the practical section enhanced by OST is to give the learner the practical skills required to apply the knowledge gained in the environment and theoretical sections of a System/Equipment Rating training course. These skills will enable the learner to operate and maintain the equipment. Within this practical section the learner will be required to demonstrate competence, during a typical set of exercises or in simulation, by performing basic operations, carrying out troubleshooting exercises, replacing and testing faulty modules and making any alignment adjustments and calibration as necessary. In order to assess practical competence, operational units will need to develop specific system/equipment performance objectives against which the performance of the learner can be measured. The learner will also be expected to apply the procedures particular to the measurement, testing and re-starting of the system/equipment in order to satisfy that it meets the standards. The learner would also be expected to demonstrate competence when working in the operational environment to the satisfaction of a unit's competence assessor.

7.3 Ongoing Competence Assessment

In order to comply with the ESARR 5 requirements, Operating Organisations should have procedures and processes in place to ensure that ATSEP working on operational ATM equipment remain competent to perform their safety-related tasks.

ATSEP should be monitored and regularly tested to ensure they maintain their competence. Operating Organisations should ensure that units have in place a fully documented ATSEP Competence Assessment Scheme.

In order maintain competence, ATSEP should carry out a minimum amount of time on preventative and corrective maintenance and calibration and certification of the system/equipment they are rated on. The minimum time should be determined by the Operating Organisation for each operational ATM system/equipment and approved by the NSA.

When setting up an ATSEP Competence Assessment Scheme, Operating Organisations should appoint and train Competence Assessors (CAs). These CAs are authorised to assess the operational competence of the ATSEP at their unit (the training and competence of CAs is detailed in Section 10 of this document). A competence assessor can only assess competence on ratings he is qualified on. The number of CAs required on an operational unit will depend on the number of ATSEP to be checked and the number of ratings held at the unit.

Ongoing competence of ATSEP at an operational unit should be assessed by a system of:

- continuous assessment, or
- dedicated practical checks, or
- a combination of both, and
- an oral check and or a written test or CBT test.

Where a competence assessor works regularly with an ATSEP he is required to check, continuous assessment may be appropriate i.e. an assessment may be achieved by the CA observing the standard of an ATSEP's work on a continuous basis as he works with him during normal operational duties.

Where a competence assessor works only occasionally during normal operational duties with an ATSEP, a dedicated practical check would be more appropriate.

An oral check or a written test or a CBT test should also be carried out at least every three years to check an ATSEP's knowledge of the procedures required for his operational safety-related tasks.

The following guidelines are provided to assist CAs when carrying out oral checks:

- an oral check should be conducted in a quiet room away from the operational area and should last approximately 30 to 45 minutes;

- the check should be conducted in an informal and non aggressive manner;

- questions should be relevant to the operational task of the ATSEP;

- during the check the ATSEP should be encouraged to raise any operational concerns, particularly safety-related matters he may have;

- questions asked during the check should be recorded by the competence assessor;

- the ATSEP should receive a full debrief at the conclusion of the check;

- If the competence assessor is not satisfied with the result of the oral check both the ATSEP and unit management should be informed, and arrangements should then be made for a further check to be carried out at a later date to cover the weak areas that were exposed during the oral check.

In a competence scheme based on continuous assessment, competence assessors should be able to identify ATSEP whose performance on safety-related tasks is declining but who are not below the required competence level. A competence assessor who identifies such a problem should discuss his concern with the ATSEP concerned to identify, if possible, the cause of the decline in performance and determine in conjunction with the unit's management any remedial action to be taken. This remedial action may include additional training or reducing the number of system/equipment ratings held.

When remedial action proves ineffective and the ATSEP's performance continues to decline, the competence assessor should conduct a dedicated practical check (or checks) to confirm his assessment. If the check (or checks) concludes that the ATSEP is not competent, the ATSEP should be immediately informed of the result and the unit's management advised. The ATSEP would then be withdrawn from performing safety-related tasks pending the outcome of a review of the case.

7.4 Suspension from Specific Tasks

Operating Organisations would be expected to withdraw an ATSEP from performing safety-related tasks associated with a particular system/equipment rating when provided with evidence that the ATSEP is not competent in that particular rating. A review of the particular case should then be carried out by the Operating Organisation and, if necessary following the review, a period of further training would be conducted to bring the ATSEP back to a satisfactory competence level. During this time the rating will be suspended and the ATSEP would not be permitted to carry out safety-related tasks associated with the rating unless under the supervision of a qualified OSTI. The rating would cease to be suspended when the ATSEP satisfactory passes a competence assessment associated with the suspended rating conducted by a competence assessor.

8.   CONTINUATION TRAINING COMPETENCE ASSESSMENT

8.1   Introduction

Continuation training is given to augment existing knowledge and skills and/ or prepare for new technologies. Continuation training includes in particular three types of training:

- Refresher training,
- Conversion training and
- Degraded systems training.

8.2   Continuation Training Performance Evaluation

Refresher training is designed to review, reinforce or upgrade existing knowledge and skills, including team skills. Refresher training should be carried out on a regular basis. ICAO recommends that such training is conducted every two or three years following completion of system/equipment rating training.

The knowledge and skills gained from refresher training would be expected to be assessed as part of the operational unit's competence assessment scheme.

Emergency training is training in emergencies, unusual situations and in degraded systems. Most of this training would be site specific and may make use of accident or incident analysis data.

With the reliability of new technology, ATSEP may go through long periods without exposure to any critical system or equipment failures. There is need for ATSEP to train and practise on equipment failures and unusual situations that may arise.

Operational ATSEP should receive emergency/unusual situation training on a regular basis. As the training is based on unusual events an assessment of competence in handling such situations would be difficult to achieve and therefore should not be carried out. However, ATSEP should receive debriefs including feedback on the training carried out.

Conversion training is when an ATSEP receives training in a new discipline or new type rating. The normal testing processes should be carried out to ensure competence.

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9. DEVELOPMENT TRAINING COMPETENCE ASSESSMENT

9.1 Introduction

In the course of their careers, ATSEP may occupy positions requiring additional levels of training and specialisation. Examples of such positions are:

- System Monitoring and Control (SMC) and
- On-site Training Instructor (OSTI)

Note: Arising from the research carried out during the development of this document it became clear that not all Operating Organisations position SMC training within Development Training. Indeed the more recent training documentation developed by EUROCONTROL acknowledges the existence of two routes to progress to the SMC rating or position.
It is not the objective of this document to favour either route. This chapter merely highlights the training necessary and competence assessment processes that could be put in place.

9.2 System Monitoring and Control Training and Competence Assessment – Training Process

SMC ATSEP are normally sited at Area Control Centres and work at SMC suites or positions. They monitor the day to day operation of all operational systems/equipment in their area of responsibility. The SMC ATSEP ensures that a quick response is made to malfunctions or failures by diagnosing the problem, activating fallback procedures and initiating the process of repair. It may also be necessary for the SMC ATSEP to coordinate with adjacent Flight Information Region (FIR) personnel.

The following list (taken from ICAO Document 7192) details the elements that should be used in SMC ATSEP training:

a) Air Navigation Services (ANS) Structure:

- ANS organisation and operation,
- Air Navigation Service Provider (ANSP) maintenance programme,
- airspace/FIR structure,
- systems/equipment providing ANS services,
- ANSP administrative practices,
- technical operations, procedures and agreements;

b) ANS System/Equipment:

- operational impacts to end users/customers due to loss or degradation of system/equipment services;
- system/equipment operation;
- user position functionality and operation;

- facilities support;

- facility power distribution configuration and operation;

c) SMC tools, processes and procedures:

- International Standards Organisation (ISO) instructions and procedures,
- maintenance agreements with outside agencies,
- SMC general processes,
- Maintenance Management System (MMS) / WS;

d) Technology:

- telecommunication;

- computer, data communications and networking principles;

- electromagnetic interference/antenna and cavity networks/ Radio Frequency (RF) propagation;

e) Human Factors:

- effective communication and coordination skills (oral and written),
- interpersonal skills,
- Team Resource Management (TRM),
- Human-Machine Interface (HMI),
- stress management.

f) Risk Assessment

The list above should also be used by Operating Organisations to assess SMC ATSEP ongoing competence.

9.3 OSTI Training and Competence Assessment

An ATSEP nominated to be an OSTI by his operational unit should attend an instructional techniques course. This course should provide appropriate training for those involved in the instruction of practical training on ATM operational equipment.

An Instructional techniques course for an OSTI should include instruction on:

- safety precautions to take before training on ATM operational equipment;

- learning processes, cognitive aspects and motivation theories;

- effective verbal communication, non verbal communication and effective listening skills;

- personal interactions, personal styles and attitudes, building positive relationships, the influence of recognition, interpersonal conflict;

- training practices such as briefing a student, monitoring the student's progress, intervention methods, feedback and debriefing;

- task training, how to build exercises and sessions dealing with equipment, measurement technique, etc;

- progressive application of instructional theory with feedback, and stress management.

It is recommended that an assessment is made at the end of the OSTI course to determine whether the prospective OSTI has met the training objectives and passed the course.

Operating Organisations should have procedures in place to assess the on-going instructional competence of OSTIs.

It is recommended that OSTIs are competence checked on their instructional techniques at least every three years by a suitable and competent person, such as a unit OSTI trained as an assessor. The table below is an example of a form that could be used to assist an assessor carrying out an OSTI competence check. The OSTI role is divided into tasks against which are listed 'assessment guidance' to assist the assessor in reaching a conclusion as to whether the OSTI is competent or not.

OSTI INSTRUCTIONAL COMPETENCE CHECK		
TASKS	**Did the OSTI**	**COMMENTS**
Preparation	▪ Verify current ability level of the learner ▪ Consult previous training reports for evidence ▪ Choose objectives and time restrictions	
Briefing of the learner	▪ Carry out pre-training briefing ▪ Provide thorough explanation of the objectives of the training to be carried out	
Instruct, monitor and provide corrective assistance	▪ Ensure that the learner participates in the decision-making process ▪ Demonstrate as necessary ▪ Provide an appropriate level of support ▪ Monitor practical skills of the learner providing advice and any corrective assistance as necessary ▪ Maintain control by not allowing safety to be compromised	
Evaluate and debrief the student/learner	▪ Monitor the learner's performance against the objectives for the training session	

OSTI INSTRUCTIONAL COMPETENCE CHECK		
TASKS	**Did the OSTI**	**COMMENTS**
	▪ Ensure the learner comments on own performance during the training session ▪ Provide factual feedback that is constructive	
Record result	▪ Provide a clear, concise and unambiguous report on the training session and the learner's progress	
Follow up action	▪ Take any follow up action as required	
Conclusion	▪ OSTI instructional competence - competent or not competent	
OSTI (signature)		
Assessor (signature)		
Date		

10.   COMPETENCE ASSESSOR TRAINING AND ASSESSMENT

10.1   Introduction

Competence assessors are normally experienced unit OSTIs who have received training in assessing the ongoing competence of ATSEP as part of a unit's competence assessment scheme.

10.2   Competence Assessor Training

A Competence Assessor (CA) will require structured training in the conduct of continuous assessments, dedicated practical checks, oral questioning and the conduct of oral checks. They would also need training in recognising and managing declining performance and in maintaining competence records.

A CA training course should endorse the use of both practical and oral assessments to determine operational competence. A CA course should include exercises in practical and oral assessment and instruction in the following topics:

- role and task of the assessor,
- Safety Regulatory Requirements,
- concept of assessment,
- human factors affecting assessment,
- oral assessing,
- practical assessing
- competence assessment debriefing.

10.3   Competence Assessor Competence Assessment

Operating Organisations should have in place procedures to assess the ongoing assessor competence of CAs. It is recommended that competence in the assessor role is checked by a suitable and qualified person (e.g. another competence assessor) at least every three years. The table below is an example of a checklist that could be used to assist during the assessment.

COMPETENCE ASSESSOR COMPETENCE ASSESSMENT FORM		
TASKS	**ASSESSMENT GUIDANCE**	**COMMENTS**
Practical Briefing	▪ The ATSEP is fully briefed prior to the practical competence check	
Collect and assess practical performance evidence by observation	▪ Notes are taken ▪ CA remains as discreet as possible ▪ Representative practical	

COMPETENCE ASSESSOR COMPETENCE ASSESSMENT FORM		
TASKS	**ASSESSMENT GUIDANCE**	**COMMENTS**
	performance is observed to reach a conclusion	
	▪ Performance is accurately assessed	
	▪ The learner is thoroughly debriefed at the conclusion of the practical check	
Carry out a knowledge check	▪ Oral/written check is conducted in an appropriate manner	
	▪ Questions are relevant and appropriate	
	▪ Answers are correctly assessed	
Collect assess and record evidence	▪ Evidence is sought from unit competence records	
	▪ All relevant evidence considered	
	▪ Assessment on competence made objectively	
	▪ Assessment correctly recorded	
Debrief of the ATSEP	▪ ATSEP debriefed in an appropriate manner	
	▪ ATSEP advised of the result and of any necessary follow up action	
Conclusion	▪ competent or not competent	
Competence Assessor (signature)		
Assessor (signature)		
Date		

A competence assessor's own operational performance on the operation and maintenance of safety-related ATM equipment should be checked at least every three years by unit competence assessors qualified in the same rating(s).

11. ATSEP COMPETENCE ADMINISTRATION AND RECORDS

11.1 Introduction

Operating Organisations should ensure that units maintain competence records for ATSEP who perform safety-related tasks. Units shall maintain a recording system which demonstrates the way in which the competence assessment process is applied. All records should be properly maintained, safely and securely filed and stored. Records must be made available for audit.

Information obtained in the course of these activities is strictly confidential.

11.2 Records and Security

11.2.1 Competence Record Contents

A competence record should include the following information:

- name of the ATSEP;
- name of CA;
- date the competence record was signed by the CA;
- dates and results of any practical assessment check carried out;
- dates and results of any knowledge check (oral, written or CBT) carried out;
- details of any continuation training carried out.

In addition to the CA signing the competence record, the CA should indicate whether the ATSEP has been assessed as competent or not competent.

ATSEP competence records should be stored at the unit in a secure place and access should be restricted to unit CA and unit management.

11.2.2 Competence Assessor Records

Competence assessors should keep their own comprehensive records on the ATSEP they are required to assess. Such records must always be kept in a secure place. Maintaining such records is particularly important when ATSEP competence is assessed by continuous assessment.

11.2.3   Maintenance of Records

Below is an example of an ATSEP competence record form that could be used to assist in the maintenance of records.

EUROCONTROL (2006b) has developed a database to support licensing authorities in the issue, maintenance and renewal of Air Traffic Controller (ATCO) Licences. Now this database is being used by training establishments and ANSPs. The database records the training, competence assessment, refresher training and medical records of the air traffic controller. The database also records the detail of ratings and endorsements achieved.

Some Member States have already developed databases specifically for use in the recording of ATSEP data.

11.2.4   Example of an ATSEP Competence Record Form

<table>
<tr><td colspan="4" align="center">ATSEP COMPETENCE RECORD</td></tr>
<tr><td colspan="4">YEAR:</td></tr>
<tr><td colspan="4">ATS UNIT:</td></tr>
<tr><td colspan="4">NAME OF ATSEP:</td></tr>
<tr><td colspan="4">RATINGS HELD:</td></tr>
<tr><td colspan="4">DATE OF ANNUAL ASSESSMENT:</td></tr>
<tr><td>Training/check received (CA to indicate if assessment by Continuous Assessment)</td><td>Date</td><td>Result
Competent or
Not Competent</td><td>Comments</td></tr>
<tr><td align="right">PRACTICAL COMPETENCE CHECK</td><td></td><td></td><td></td></tr>
<tr><td align="right">KNOWLEDGE CHECK (ORAL, WRITTEN or CBT)</td><td></td><td></td><td></td></tr>
<tr><td align="right">CONTINUATION TRAINING RECEIVED</td><td></td><td></td><td></td></tr>
<tr><td colspan="4" align="center">COMPETENCE ASSESSMENT: COMPETENT / NOT COMPETENT</td></tr>
<tr><td align="right">ATSEP (signature)</td><td colspan="3"></td></tr>
<tr><td align="right">Competence Assessor (signature)</td><td colspan="3"></td></tr>
<tr><td align="right">Date</td><td colspan="3"></td></tr>
</table>

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ABBREVIATIONS AND ACRONYMS

For the purposes of this document the following abbreviations and acronyms shall apply:

ANS	Air Navigation Services
ANSP	Air Navigation Service Provider
ATCO	Air Traffic Controller *(US)*
ATSEP	Air Traffic Safety Electronics Personnel
CA	Competence Assessor
CNS/ATM	Communication, Navigation and Surveillance/Air Traffic Management
DAS/HUM	Directorate ATM Strategies / Human Factors Management Business Division *(EUROCONTROL Headquarters, SD)*
EATCHIP	European ATC Harmonisation and Integration Programme *(now 'EATM')*
EATM(P)	European ATM (Programme) *(formerly 'EATCHIP')*
ECAC	European Civil Aviation Conference
ESARR	EUROCONTROL Safety Regulatory Requirement *(SRC)*
EUROCONTROL	European Organisation for the Safety of Air Navigation
FIR	Flight Information Region
HRT	Human Resources Team *(EATCHIP/EATM(P))*
HUM	Human Resources (Domain) *(EATCHIP/EATM(P))*
IANS	Institute of Air Navigation Services *(EUROCONTROL, Luxembourg)*
ICAO	International Civil Aviation Organization
LRM	Lowest Replaceable Module
MMS	Maintenance Management System

MUAC	Maastricht Upper Area Control Centre
NSA	National Supervisory Authorities
OST	On-Site Training
OSTI	On-Site Training Instructor
RF	Radio Frequency
SD	Senior Director (EUROCONTROL Headquarters)
SMC	System Monitoring and Control
TFATMTST	Task Force ATM Technical Staff *(EATM/HRT/TFG)*
TFG	Training Focus Group *(EATM, HRT; formerly known as 'TSG')*
TRM	Team Resource Management
TSG	Training Sub-Group (*EATCHIP/EATMP, HRT; today known as 'TFG'*)
WGATMTS	Working Group ATM Technical Staff *(EATCHIP/ EATM(P), HRT, TSG/TFG)*

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