



ATSEP LICENCE KNOWLEDGE TEST GUIDES (KTG)

SECTION 1 - GENERAL

1. PURPOSE

- A. This Advisory Circular (AC) is issued to provide guidance to provide information for applicants preparing to take the Air Traffic Safety Electronic Personnel (ATSEP) Licence and Ratings Knowledge Test. Appendices provide subject matter outlines, reference materials, and sample questions.

2. STATUS OF THE ADVISORY CIRCULAR

This AC is an original issuance.

3. BACKGROUND

- A. The requirements for the licensing and rating of Air Traffic Safety Electronics Personnel (ATSEP) as defined in Subpart 23.7 of Part 23 of Ghana Civil Aviation (ANS) Directives requires the eligible applicants to take Knowledge Test for the issuance of the ATSEP License.
- B. This Knowledge Test Guides (KTGs) describe the knowledge testing policy and procedures for ATSEP licence area. They also provide specific guidelines for satisfactory or unsatisfactory performance of applicants and sample examination questions.

4. APPLICABILITY

This AC is applicable to individuals seeking to take the Authority's Knowledge Test in order to obtain Air Traffic Safety Electronic Personnel (ATSEP) License.



5. RELATED DIRECTIVES

This AC is related to the Part 23 – Aeronautical Telecommunication (Subpart 23.7: ATSEP LICENSING) of the Ghana Civil Aviation (Air Navigation Services) Directives:

6. RELATED READING MATERIAL

- A. ICAO Annex 10 – Aeronautical Telecommunications, Volume I–V.
- B. ICAO DOC 10057 - The Manual on Air Traffic Safety Electronics Personnel Competency-based Training and Assessment
- C. ICAO DOC 9841 – Manual on the Approval of Training organizations
- D. ICAO DOC 9868 – Procedure for Air Navigation Services Training
- E. ICAO DOC 9379 – Manual of Procedures for Establishment and Management of a State’s Personnel Licensing System
- F. GCAA ATSEP Licensing Procedures Manual
- G. AC-CNS-001, ATSEP Licensing

7. ACRONYMS

AC	-	Advisory Circular
ANS	-	Air Navigation Service
ANSP	-	Air Navigation Service Provider
ATSEP	-	Air Traffic Safety Electronics Personnel
GCAA	-	Ghana Civil Aviation Authority
GCAD	-	Ghana Civil Aviation Directives
DG	-	Director General
CNS	-	Communication, Navigation and Surveillance
PEL	-	Personnel Licensing
OJT	-	On-the-Job Training
OJTI	-	On-the-Job Training Instructor
ATO	-	Approved Training Organization

SECTION B - GUIDANCE AND PROCEDURES

8. GENERAL INFORMATION –

A. USE OF THE KNOWLEDGE TEST GUIDE

Knowledge Test Guides (KTGs) describe the knowledge testing policy and procedures for each licence area. They also provide specific test information, such as test name, test code (three-digit test identifiers), number of questions, and the time (hours) allotted for each knowledge test. The test identifiers will assist ATSEP in selecting the proper test for the licence/rating being sought.

B. This KTG should answer most questions about taking the Air Traffic Safety Electronic Personnel Licence and Ratings Knowledge Tests by covering the following areas:

- i. Knowledge test eligibility requirements
- ii. Knowledge areas on the tests
- iii. Descriptions of the tests
- iv. Process for taking a knowledge test
- v. Validity of ATSEP Test Reports
- vi. Use of test aids and materials
- vii. Cheating or other unauthorized conduct
- viii. Retesting procedures
- ix. Obtaining training, testing publications, and general information.



- C. This guide will help applicants prepare for the following knowledge tests:
- i. ATSEP Trainee License
 - ii. ATSEP – License with the following ratings:
 - 1. Communication Rating - ATSEP-Comm
 - 2. Navigation Rating - ATSEP-Nav
 - 3. Surveillance Rating - ATSEP-Surv
 - 4. ATSEP Instructor Rating - ATSEP-Instructor
- D. Appendix A, List of ATSEP Basic Reference Materials, of this KTG lists reference materials for applicants to study during their training for the Air Traffic Safety Electronic Personnel licence. The questions on the knowledge test will come from these reference materials.
- E. This KTG is not offered as an easy way to obtain the necessary information for passing the ATSEP knowledge tests. Rather, the intent is to define and narrow the field of study to the required knowledge areas included in each test.
- F. Ghana Civil Aviation Authority (GCAA) ATSEP knowledge tests are a very effective instrument for aviation safety and regulatory compliance. However, these tests can only sample the vast amount of knowledge every ATSEP must possess to operate safely in an increasingly complex aviation system.

9. KNOWLEDGE TEST ELIGIBILITY REQUIREMENTS

- A. Individuals pursuing an ATSEP licence and/or ratings should review the Ghana Civil Aviation (ANS) Directives (GCADs) Part 23, Subpart 23.7 – ATSEP Licensing and the GCAA ATSEP Licensing Procedures Manual.

- B. The applicant for an ATSEP Licence or Rating Knowledge Test must be at least 18 years of age.

10. KNOWLEDGE AREAS ON THE TESTS

ATSEP Knowledge Tests are comprehensive because they must test the applicant's knowledge in many subject areas. Applicants should consult the Manual on Air Traffic Safety Electronics Personnel Competency based Training and Assessment (ICAO Doc 10057) for knowledge areas on the tests:

- A. ATSEP Trainee License
- B. ATSEP – License with the following ratings:
 - i. Communication Rating - ATSEP-Comm
 - ii. Navigation Rating - ATSEP-Nav
 - iii. Surveillance Rating - ATSEP-Surv
 - iv. ATSEP Instructor Rating - ATSEP-Instructor

11. DESCRIPTIONS OF THE TESTS

- A. All test questions are the objective, multiple-choice type. Each question can be correctly answered by the selection of a single response or multiple responses as appropriate and is independent of other questions; therefore, a correct response to one does not depend upon, or influence, the correct response to another. The minimum passing score is 70 percent.
- B. The following tests each contain 100 questions, and applicants are allowed a maximum of 1.5 hours to complete the test.



- C. The Knowledge test is administered through Computer Based Testing (CBT). Knowledge Test applicants should be sure to carefully read the instructions given with each test, as well as the statements in each test item.
- D. When taking a knowledge test, keep the following points in mind:
- i. Answer each question in accordance with the latest regulations and guidance publications.
 - ii. Read each question carefully before looking at the possible answers. Test applicants should clearly understand the problem before attempting to solve it.
 - iii. After formulating an answer, determine which choice corresponds with that answer. The answer chosen should completely resolve the problem.
 - iv. From the answer choices given, it may appear there is more than one possible answer, however, there is only one answer that is correct and complete. The other answers are either incomplete or erroneous, or they represent common misconceptions.
 - v. If a certain question is difficult, it is best to mark it for review and proceed to the next question. After answering the less difficult questions, return to those marked for review and answer them. The review marking procedure will be explained to test applicants prior to starting the test. Although the computer should alert test applicants to unanswered questions, test applicants should make sure every question has an answer recorded. Following these procedures will enable test applicants to use the available time to maximum advantage.
 - vi. When solving a calculation problem, the answer closest to the applicant's solution should be selected. The problem has been checked with various types of calculators; therefore, if the problem



has been solved correctly, the applicant's answer will be closer to the correct answer than any of the other choices.

12. PROCESS FOR TAKING A KNOWLEDGE TEST

- A. The first step in the process of taking a knowledge test is to contact the GCAA PEL office. The office can provide applicants with information relating to knowledge test prerequisites, required authorizations and endorsements, testing locations, and the appropriate fees.
- B. The second step in the process of taking a knowledge test is for the applicant to complete the required training and receive an endorsement from an authorized instructor or approved training organization (ATO). Acceptable forms of endorsement are:
 - i. A certificate of graduation or a statement of accomplishment certifying the satisfactory completion of the initial training or system/equipment training. The certificate or statement may be issued by an ATO.
 - ii. A written statement or logbook endorsement from an authorized on-the-job training instructor (OJTI) certifying the applicant has completed an applicable practical training and is prepared to take the knowledge test.
 - iii. A failed, passed, or expired ATSEP Knowledge Test Report, provided the ATSEP still has the original report in his or her possession.
 - iv. An "expired test/credit" letter issued by Ghana CAA (in lieu of a duplicate ATSEP Knowledge Test Report).
- C. The third step in the process of taking a knowledge test is for the applicant to receive written authorisation from GCAA.



- D. The fourth step in taking a knowledge test is to proceed to the GCAA PEL computer test centre. An applicant for a knowledge test must provide proper identification. Testing centre personnel will not begin the test until the test applicant's identification is verified.
- E. Upon completion of the knowledge test, each applicant will receive an ATSEP Knowledge Test Report showing his or her test score.
- F. Applicants requiring a duplicate ATSEP Knowledge Test Report due to loss or destruction of the original should send a signed request to the Ghana Civil Aviation Authority, Personnel Licensing Office, PMB, KIA, Accra, Ghana.

13. VALIDITY OF ATSEP KNOWLEDGE TEST REPORTS

- A. The ATSEP Knowledge Test Report is certified with an embossed seal to authenticate the validity of the document. ATSEP Knowledge Test Reports for the ATSEP licences are valid for 24 calendar months.
- B. The applicant should plan to complete the skill test during the 24-calendar-month validity period. If the ATSEP Knowledge Test Report expires before completion of the skill test, the applicant must retake the knowledge test.

14. USE OF TEST AIDS AND MATERIALS

Knowledge test applicants may use aids, reference materials, and test materials within the guidelines listed below. All models of aviation-oriented calculators may be used, including small electronic calculators that perform only arithmetic functions (add, subtract, multiply, and divide). Simple programmable memories, which allow addition to, subtraction from, or retrieval of one number from the memory, are permissible. Also, simple functions, such as square root and percent keys are permissible. The following guidelines apply:



- A. Applicants may use any reference materials provided with the test. In addition, applicants may use scales, straightedges, protractors, plotters, navigation computers, log sheets, holding pattern entry aids, and electronic or mechanical calculators that are directly related to the test.
- B. Manufacturers permanently inscribed instructions on the front and back of such aids (e.g., formulas, conversions, regulations, signals, weather data, holding pattern diagrams, frequencies, mass and balance formulas, and air traffic control procedures) are permissible.
- C. GCAA personnel may provide a calculator to applicants and/or deny use of the applicant's personal calculator based on the following limitations:
 - i. Prior to, and upon completion of the test, while in the presence of the test examiner, applicants must actuate the ON/OFF switch and perform any other function that ensures erasure of any data stored in memory circuits, including removal of batteries.
 - ii. The use of electronic calculators that incorporate permanent or continuous type memory circuits without erasure capability is prohibited. The test examiner may refuse the use of the applicant's calculator when unable to determine the calculator's erasure capability. Printouts of data must be surrendered at the completion of the test if the calculator incorporates this design feature.
 - iii. The use of magnetic cards, magnetic tapes, modules, computer chips, or any other device upon which pre-written programmes or information related to the test can be stored and retrieved is prohibited.
 - iv. Applicants are not permitted to use any booklet or manual containing instructions related to use of test aids.
- D. Dictionaries are not permitted in the testing area.



- E. The GCAA test examiner makes the final determination regarding test materials and personal possessions the applicant may take into the testing area.

15. CHEATING OR OTHER UNAUTHORISED CONDUCT

- A. Computerized knowledge testing must be carried out in accordance with the strictest security procedures to avoid test compromise. The GCAA test examiner will terminate a test at any time that he or she suspects that a cheating incident has occurred.
- B. A GCAA investigation will then be conducted. If the investigation determines that cheating or unauthorized conduct has occurred, any ATSEP licence, certificate, or rating the applicant holds may be revoked, and the applicant will be prohibited for 1 year from applying for or taking any test for a licence, certificate, or rating under Subpart 23.7 of Part 23 of Ghana Civil Aviation (ANS) Directives.

16. RETESTING PROCEDURES

- A. Applicants who receive a grade lower than 70 percent and who wish to retest must present the following to GCAA testing centre personnel when appearing for the purpose of retesting:
 - i. A failed ATSEP Knowledge Test Report.
 - ii. A written endorsement from an authorized instructor certifying that additional instruction has been given, and the instructor finds the applicant competent to pass the test; and
 - iii. A written authorization from GCAA to retake the test.
- B. Applicants possessing an ATSEP Knowledge Test Report with a score of 70 percent or higher who decide to retake the test in anticipation of a



better score, may retake the test after 30 days from the date their last test was taken. GCAA will not allow applicants to retake a passed test before the 30-day period has lapsed. Prior to retesting, applicants will be required to surrender their current ATSEP Knowledge Test Report to the test examiner. The last test taken will reflect the official final score.

17. OBTAINING TRAINING, TESTING PUBLICATIONS, AND GENERAL INFORMATION

Most of the current GCAA ATSEP training and testing publications can be obtained from the GCAA PEL Office or in electronic format on the GCAA website at <http://www.gcaa.com.gh>.

18. ATSEP Knowledge Test Items

Sample questions are contained in the appendices to this KTG and are representative of questions for ATSEP knowledge tests. These will help ATSEP become familiar with similar questions on the ATSEP knowledge tests. The knowledge test is not designed to intimidate any prospective licensee; it is designed to measure the level of competency required to receive a Ghana CAA licence. The reference materials contained in the appendices to this KTG are provided to ensure that instructors and students are able to determine the importance of the subject matter to be taught and learned.

19. COMPUTER TESTING SUPPLEMENTS

The computer testing supplements may contain the graphics, legends, and charts that are needed to successfully respond to certain knowledge test items. These supplements will be provided by GCAA test centre personnel during the ATSEP knowledge test.

20. REFERENCE MATERIALS/LEARNING STATEMENT CODES



The appendices to this KTG contain reference materials and sample test questions with related learning statements used for ATSEP knowledge testing. These reference materials and learning statements have been prepared by the Ghana Civil Aviation Authority to establish specific references for all knowledge standards.

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DIRECTOR GENERAL
GHANA CIVIL AVIATION AUTHORITY



APPENDICES

1. APPENDIX A – LIST OF ATSEP LICENSE REFERENCE MATERIALS

- A. The publications listed below contain study material applicants need to be familiar with when preparing for the ATSEP Knowledge Test.
- B. Most of these publications can be obtained from GCAA or downloaded from the GCAA website at <http://www.gcaa.com.gh>.
- C. International Civil Aviation Organization (ICAO) publications can be purchased from ICAO at: <http://www.icao.int>.
- D. Textbooks should be purchased at a bookstore or from the publisher.
- E. The most recent issuance of the listed references should be requested:
 - i. Ghana Civil Aviation Acts
 - ii. Ghana Civil Aviation (ANS) Directives, in particular:
 - 1. Part 1 of GCAD on ANS which contains General Policies, Procedures, and Definitions and IS
 - 2. Subpart 23.7 of Part 23 Ghana Civil Aviation (ANS) Directives
 - 3. ICAO Doc 10057 Manual on ATSEP Competency Based Training and Assessment

2. SUBJECT MATTER OUTLINE

The following outlines the major topics and underlying content areas on the Air Traffic Safety Electronic Personnel – Knowledge Test.

- A. ***Familiarization with Air Navigation Services:***
 - i. International/national organizations and standards



- ii. Working positions and environment
- iii. Environmental protection
- iv. Personal safety

B. Familiarization with Air Traffic Services, Airspace Standards, Meteorology and Altimetry

- i. Airspace users and customer relations;
- ii. Air traffic management;
- iii. Separation standards and collision avoidance;
- iv. Meteorology, altimeter and level allocation;
- v. Atmosphere and atmospheric processes;
- vi. Meteorological phenomenal and codification;
- vii. Meteorology tools and equipment; and
- viii. Altimetry and operational aspects.

C. Familiarization With CNS/ATM Concepts:

i. Communication systems:

- 1. Voice communications — General
- 2. Air–Ground–Air
- 3. Ground–Ground
- 4. Recording
- 5. Data Link communications

ii. Navigation & Radio Navigation Aids:

- 1. Navigation — General
- 2. Radio navigation aids;



3. Satellite-based system – GNSS technical overview –
Satellite navigation;
4. Aircraft systems;
5. Flight inspections;

iii. Surveillance and Radars:

1. Radar;
2. Surface movement control;
3. Radar formats;
4. Automatic dependent surveillance;
5. Future systems;
6. Radar station;

iv. Networks

1. ATM specific networks;

v. Data Processing (DP):

1. Radar data processing;
2. Flight plan processing;
3. Display;
4. On-line and environmental data;

vi. Facilities:

1. Power supply;
2. Air conditioning;
3. Monitoring;
4. Electromagnetic compatibility.



Sample Questions and Answers

1. What tasks are NOT objective of maintenance?

- a) Plan and perform regular works on system based on supplier recommendation
- b) Testing new configuration or new releases of operating software
- c) Verify operability of backup system

2. Maximum AFTN message text length is?

- a) 1800 bytes of binary data
- b) 16kB of binary data
- c) 4096 characters
- d) 1800 characters with some additional restrictions

3. DME is able to answer at a time no more than?

- a) 100 interrogations
- b) 500 interrogations
- c) 50 interrogations
- d) 200 interrogations

4. The reply frequency of a secondary surveillance radar is?

- a) 1030 MHz
- b) 1060 MHz
- c) 1090 MHz

APPENDIX B LIST OF ATSEP COMMUNICATION RATING REFERENCE MATERIALS

1. The publications listed below contain study material applicants need to be familiar with when preparing for the ATSEP Communication Rating Knowledge Test.
2. Most of these publications can be obtained from GCAA or downloaded from the GCAA website at <http://www.gcaa.com.gh>.
3. International Civil Aviation Organization (ICAO) publications can be purchased from ICAO at: <http://www.icao.int>.
4. Textbooks should be purchased at a bookstore or from the publisher.
5. The most recent issuance of the listed references should be requested:
 - A. Ghana Civil Aviation Acts
 - B. Ghana Civil Aviation (ANS) Directives, in particular:
 - C. Part 1 of GCAD on ANS which contains General Policies, Procedures, and Definitions and IS
 - D. Subpart 23.7 of Part 23 Ghana Civil Aviation (ANS) Directives
 - E. ICAO Doc 10057 Manual on ATSEP Competency Based Training and Assessment

6. Subject Matter Outline

The following outlines the major topics and underlying content areas on the Air Traffic Safety Electronic Personnel – Communication Rating Knowledge Test:

- A. Voice – Air – Ground;
- B. Voice – Ground – Ground;
- C. Data – Introduction to networks;
- D. Data – National networks;

- E. Data – International networks;
- F. Data – Global networks;
- G. Data – Protocols;
- H. Transmission path – Lines;
- I. Transmission path – Specific links;
- J. Recorders – Legal recorders;
- K. Safety attitude and functional safety; and
- L. Health and safety.

Sample Questions and Answers

1. What does VHF mean?

- a) Very Hot Frequency
- b) Verified High Frequency
- c) Very High Frequency

2. The two main parts of Voice Communication System (VCS) are:

- a) Internal part and external part
- b) Volume control and interfaces
- c) Audio part and video part
- d) Radio part and telephone part

3. Which of these have best resistance to Electromagnetic Interference (EMI)?

- a) Coaxial cable
- b) Fiber optic cable



c) STP cable

4. A Microwave link consist of the following parts (Multichoice)?

- a) Antenna Towers
- b) ODU and IDU
- c) Wave guide
- d) Digital Distribution Frame (DDF)

APPENDIX C LIST OF ATSEP NAVIGATION RATING REFERENCE MATERIALS

1. The publications listed below contain study material applicants need to be familiar with when preparing for the ATSEP Navigation Rating Knowledge Test.
2. Most of these publications can be purchased from GCAA or downloaded from the GCAA website at <http://www.gcaa.com.gh>.
3. International Civil Aviation Organization (ICAO) publications can be purchased from ICAO at: <http://www.icao.int>.
4. Textbooks should be purchased at a bookstore or from the publisher.
5. The most recent issuance of the listed references should be requested.
 - A. Ghana Civil Aviation Acts
 - B. Ghana Civil Aviation (ANS) Directives, in particular:
 - C. Part 1 of GCAD on ANS which contains General Policies, Procedures, and Definitions and IS
 - D. Subpart 23.7 of Part 23 Ghana Civil Aviation (ANS) Directives
 - E. ICAO Doc 10057 Manual on ATSEP Competency Based Training and Assessment

6. Subject Matter Outline

The following outlines the major topics and underlying content areas on the Air Traffic Safety Electronic Personnel – Communication Rating Knowledge Test:

- A. NAV Concepts;
- B. Ground-based systems — NDB/Locator;
- C. Ground-based systems — VDF/DDF/IDF;
- D. Ground-based systems — VOR;



- E. Ground-based systems — DME;
- F. Ground-based systems — ILS;
- G. Ground-based systems — MLS;
- H. Satellite-based navigation systems — GNSS1;
- I. Satellite-based navigation systems — GBAS;
- J. Satellite-based navigation systems — SBAS;
- K. Satellite-based navigation systems — ABAS;
- L. Satellite-based navigation systems — Modernized GPS;
- M. Satellite-based navigation systems — GALILEO;
- N. Satellite-based navigation systems — GNSS2;
- O. On-board navigation architecture;
- P. Display systems;
- Q. Inertial navigation;
- R. Vertical navigation;
- S. Safety attitude and functional safety;
- T. Health and safety.

Sample Questions, Answers, and Learning Statements

1. What are the main radio subsystems of an ILS?

- a) Localizer transmitter, VOR and DME
- b) Localizer transmitter, outer Marker and DME
- c) Localizer transmitter, glide path transmitter and DME



2. The DME principle is?

- a) To determine the difference in depth of modulation (DDM) of two radio signals
- b) To interpret the phase shift of two radio signals
- c) To measure the delay time between a transmitted interrogation and received reply.

3. What is the name of the Russian GNSS system?

- a) PROTON
- b) GLONASS
- c) GALILEO

4. What is the equivalent of 1NM?

- a) 1.852 km
- b) 3.142 km
- c) 1.609 km

APPENDIX D LIST OF ATSEP SURVEILLANCE RATING MATERIALS

1. The publications listed below contain study material applicants need to be familiar with when preparing for the ATSEP Surveillance Rating Knowledge Test.
2. Most of these publications can be obtained from GCAA or downloaded from the GCAA website at <http://www.gcaa.com.gh>.
3. International Civil Aviation Organization (ICAO) publications can be purchased from ICAO at: <http://www.icao.int>.
4. Textbooks should be purchased at a bookstore or from the publisher.
5. The most recent issuance of the listed references should be requested:
 - A. Ghana Civil Aviation Acts
 - B. Ghana Civil Aviation (ANS) Directives, in particular:
 - C. Part 1 of GCAD on ANS which contains General Policies, Procedures, and Definitions and IS
 - D. Subpart 23.7 of Part 23 Ghana Civil Aviation (ANS) Directives
 - E. ICAO Doc 10057 Manual on ATSEP Competency Based Training and Assessment

6. Subject Matter Outline

The following outlines the major topics and underlying content areas on the Air Traffic Safety Electronic Personnel – Communication Rating Knowledge Test:

- A. Surveillance/Primary — ATC Surveillance;
- B. Surveillance/Primary — Meteorology;
- C. Surveillance — SMR;
- D. Surveillance/Secondary — SSR and M-SSR;



- E. Surveillance/Secondary — Mode S;
- F. Surveillance/Secondary — SSR Environment;
- G. Surveillance — General View on ADS;
- H. Surveillance — ADS-B;
- I. Surveillance — ADS-C;
- J. Surveillance — HMI;
- K. Safety attitude and functional safety; and
- L. Health and safety.

Sample Questions, Answers, and Learning Statements

1. Which of the following SSR codes highlights Illegal Act (hijack) on-board the aircraft?

- a) 7500
- b) 7600
- c) 7700

2. ASTERIX in Surveillance Data Processing is a

- a) Data transfer protocol
- b) Standard message format used for the exchange of SUR data
- c) Friend of Obelix
- d) Unique method to transfer SUR data.

3. What is the principle of Multilateration?



- a) Different Receiver stations compare the reception of SSR signals
- b) Multi frequency transmitters
- c) parabolic antennas

APPENDIX F LIST OF ATSEP INSTRUCTOR RATING REFERENCE MATERIALS

1. The publications listed below contain study material applicants need to be familiar with when preparing for the ATSEP Instructor Rating Knowledge Test.
2. Most of these publications can be obtained from GCAA or downloaded from the GCAA website at <http://www.gcaa.com.gh>.
3. International Civil Aviation Organization (ICAO) publications can be purchased from ICAO at: <http://www.icao.int>.
4. Textbooks should be purchased at a bookstore or from the publisher.
5. The most recent issuance of the listed references should be requested:
 - A. Ghana Civil Aviation Acts
 - B. Ghana Civil Aviation (ANS) Directives, in particular:
 - C. Part 1 of GCAD on ANS which contains General Policies, Procedures, and Definitions and IS
 - D. Subpart 23.7 of Part 23 Ghana Civil Aviation (ANS) Directives
 - E. ICAO Doc 10057 Manual on ATSEP Competency Based Training and Assessment

6. Subject Matter Outline

ATSEP instructor ratings issued are appropriate to Communication, Radio navigation aids, Surveillance, Data Processing and Power systems.

A. Requirements for the issue of the rating

i. Knowledge

The applicant shall have met the knowledge requirements for the issue of an ATSEP license as appropriate to the category of rating included in the license. In addition, the applicant shall have demonstrated a level of knowledge appropriate to the privileges

granted to the holder of an ATSEP instructor rating, in at least the following areas:

1. techniques of applied instruction;
2. assessment of student performance in those subjects in which CNS/ATM instruction is given;
3. the learning process;
4. elements of effective teaching;
5. student evaluation and testing, training philosophies;
6. training programme development;
7. lesson planning;
8. classroom instructional techniques;
9. use of training aids, including standby or real equipment or special equipment for development and training purposes as appropriate;
10. analysis and correction of student errors;
11. human performance relevant to CNS/ATM instruction including principles of threat and error management;
12. hazards involved in simulating system failures and malfunctions in the equipment.

ii. **Skill**

The applicant shall have demonstrated, in the category and rating of systems or equipment for which ATSEP instructor privileges are sought, the ability to instruct in those areas in which CNS/ATM instruction is to be given, including on-the- job instruction as appropriate.



iii. **Experience**

The applicant shall have met the experience requirements for the issue of an ATSEP license for each rating category, as appropriate.

B. **CNS/ATM system/equipment instruction**

The applicant shall be accepted by the Licensing Authority for that purpose, and shall:

- i. have received instruction in CNS/ATM instructional techniques including demonstration, student practices, recognition and correction of common student errors; and
- ii. have practised instructional techniques in those CNS/ATM system/equipment maintenance procedures and standards in which it is intended to provide CNS/ATM instruction.

C. **Training**

The applicant for an ATSEP Instructor rating should have completed a course of training appropriate to the privileges to be granted.

7. Privileges of the holder of the rating and the conditions to be observed in exercising such privileges

The privileges of the holder of an ATSEP instructor rating shall be:

- A. To conduct OJT for ATSEP Licence applicants and
- B. To carry out CNS/ATM instruction for the issue of an ATSEP licence for:
 - i. a CNS/ATM system/equipment category rating and
 - ii. an ATSEP instructor rating provided that the CNS/ATM instructor:
 1. holds at least the licence and rating for which instruction is being given, in the appropriate system/equipment category;



2. holds the licence and rating necessary to act as the OJTI of the system/equipment on which the instruction is given; and
3. has the CNS/ATM instructor privileges granted entered on the licence.

8. Training requirements for ATSEP Instructor Rating

- A. Classroom instructional techniques which shall include:
- i. quality of a good instructor;
 - ii. principle of adult learning; the learning process use and structure of a lecture;
 - iii. how to design and structure a lesson, lesson plan; including design of instructional events, selection of training techniques and selection of media options questioning techniques;
 - iv. elements and formulation of training objectives;
 - v. use of teaching aids; including standby or real equipment or special equipment for development and training purposes as appropriate;
 - vi. principle of student motivation;
 - vii. analysis and correction of student errors student evaluation and testing ;qualities and types of written tests;
 - viii. how to administrate practical exercises (written, small group discussion, group discussion, lab, role play, simulator); and
 - ix. practical exercises presenting one lecture and one lesson.
 - x. human performance relevant to CNS/ATM instruction including principles of threat and error management;
 - xi. hazards involved in simulating system failures and

- xii. malfunctions in the equipment.
- B. On-the-job training and Teaching techniques and coaching practices on equipment program should include:
- i. safety precautions to take before teaching practical training on equipment;
 - ii. learning processes, cognitive aspects and motivation theories;
 - iii. effective verbal communication, non verbal communication and effective listening skills;
 - iv. personal interactions, personal styles and attitudes, building positive relationships, the influence of recognition, interpersonal conflict;
 - v. training practices such as briefing a student, monitoring the student's progress, intervention methods, feedback and debriefing;
 - vi. task training, how to built practical exercises and sessions dealing directly with equipment, measurement technique, etc.;
 - vii. progressive application of coaching theory with feedback; and
 - viii. stress recognition and stress management.
- C. Assessment training programme for evaluating the initial and continued operational competency of Air Traffic Safety Electronic Personnel should include at least the following:
- i. role and task of assessor;
 - ii. international safety regulatory requirement;
 - iii. concept of assessment;
 - iv. Human Factors affecting assessment;
 - v. the oral part of the assessment and the scenario of interview;



- vi. the practical part of the assessment process and work on equipment;
- vii. assessment for competency;
- viii. maintenance of competency;
- ix. competency assessment debriefing; and
- x. exercises in practical and oral assessment.

End of Advisory