

No. 419

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**SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)**

In accordance with Regulation 24(c) of the National Standards Bodies Regulations of 28 March 1998, the Standards Generating Body (SGB) for

**Aerospace Operations**

registered by Organising Field 10, Physical, Mathematical, Computer and Life Sciences, publishes the following qualification and unit standards for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the qualification and unit standards. The full qualification and unit standards can be accessed via the SAQA web-site at [www.saqqa.org.za](http://www.saqqa.org.za). Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, SAQA House, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the qualification and unit standards should reach SAQA at the address below *and no later than 11 June 2007*. All correspondence should be marked Standards Setting – Aerospace Operations addressed to

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## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### QUALIFICATION:

#### National Certificate: Aerodrome Control

SAQA QUAL ID	QUALIFICATION TITLE		
58580	National Certificate: Aerodrome Control		
SGB	PROVIDER		
SGB Aerospace Operations			
ETQA			
QUALIFICATION TYPE	FIELD	SUBFIELD	
National Certificate	10 -Physical, Mathematical, Computer and Life Sciences	Physical Sciences	
ABET BAND	MINIMUM CREDITS	NQF LEVEL	QUAL CLASS
Undefined	140	Level 5	Regular-Unit Stds

### PURPOSE AND RATIONALE OF THE QUALIFICATION

#### Purpose:

The combination of learning outcomes that comprise this qualification will provide the qualifying learner with vocational knowledge and skills appropriate to the context of aerodrome control. The learner will have an understanding of aerodrome control and how to interpret the air traffic situation for aerodrome control purposes. This qualification will provide the opportunity for learners to develop their practical skills with the essential knowledge required for aerodrome control.

The qualifying learner will be able to:

- Appreciate the traffic situation in an aerodrome control environment.
- Assess and respond to an emergency in an aerodrome control environment.
- Control ground and airborne traffic within a designated area of responsibility.
- Interact in an air traffic control system influenced by the inter-relationships of technology, people, procedures and the environment.

This qualification is the second qualification in a pathway of three (3) qualifications for learners in the air traffic management environment. Learners can move along the pathway through the achievement of clusters of unit standards that lead to the attainment of various military and/or civilian Air Traffic Management (ATM) ratings.

#### Rationale:

As a result of new generation aircraft, an increase in air traffic and new communication, navigation and surveillance (CNS) technology a demand has arisen for greater public safety as a critical requirement in the aerospace industry.

This qualification contributes to the South African aerospace industry, which impacts on the safety of people and goods for economic development. Learners who have achieved this qualification will contribute to reduction of risk in the aerospace industry. Qualifying learners that will typically embark on this qualification are Air Traffic Service Assistants (ATSA).

This qualification will facilitate the development of a professional community specifically for Air Traffic Service Support who are able to contribute towards a safe and productive air traffic

services environment as well as the safe and efficient management of the co-ordination process of air traffic through applied knowledge, skills, attitudes and values.

This qualification enables the learners to develop competencies such as self-discipline, critical decision-making, safety, situational awareness, judgement, logically reasoning, ethics, integrity, and responsibility, to the operation of safe, efficient and comprehensive national and international aerospace systems.

This qualification has been generated in accordance with the national and international legal framework and also provides a vehicle to bring South African Air Traffic Management standards in line with international best practice.

### **RECOGNIZE PREVIOUS LEARNING?**

**Y**

### **LEARNING ASSUMED TO BE IN PLACE**

It is assumed that learners are competent in the outcomes contained in the National Certificate: Air Traffic Services Support NQF Level 5.

- Note: This qualification includes the licensing requirements of international and national regulations, which is mandatory before a learner is allowed to proceed with further learning and rating processes.

Recognition of Prior Learning:

The Qualification may be obtained in whole or in part through the process of Recognition of Prior Learning. Learners who meet the requirements of any Unit Standard in this Qualification may apply for recognition of prior learning to the relevant ETQA.

Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution, which is accredited by the relevant ETQA.

Access to the qualification:

- Learners with certain physical (visual, auditory etc) impairments may find it difficult to complete the qualification successfully without meeting certain medical requirements.
- Learners accessing this qualification should first complete the National Certificate: Air Traffic Services Support:
  - Note: This qualification includes the licensing requirements of international and national regulations, which is mandatory before a learner is allowed to proceed with further learning and rating processes.

### **QUALIFICATION RULES**

- Learners must complete all unit standards totalling 30 credits in the Fundamental component,
- Learners must complete all unit standards totalling 74 credits in the Core component.
- Learners must complete unit standards totalling 36 credits from the Elective component of the qualification.

The Elective unit standard category is open ended to allow the learner to choose the 36 credits associated to the Elective unit standards from any discipline that would add value to the purpose of the qualification or the learners own development on a learning pathway within the sector.

### **EXIT LEVEL OUTCOMES**

On completion of this Qualification learners are able to:

1. Appreciate the traffic situation in an aerodrome control environment

2. Assess and respond to an emergency in an aerodrome control environment.
3. Control ground and airborne traffic within a designated area of responsibility.
4. Interact in an air traffic control system influenced by the inter-relationships of technology, people, procedures and the environment.

#### **ASSOCIATED ASSESSMENT CRITERIA**

1.
  - Air traffic is assessed in terms of its impact on the current and projected air traffic situation.
  - The competence of air traffic control personnel is assessed to inform the work place skills plan.
  - Quality assurance audits are conducted in accordance with the organisational quality management plan.
  - Range: Quality assurance audits include but are not limited to aviation safety, staff readiness, occupational health and safety, equipment serviceability.
  - Note: It is assumed that the audit outcome includes recommendations to rectify shortcomings.
  - Air traffic is controlled in accordance with laid down procedures during a simulated disaster exercise.
  - Aeronautical information is interpreted and distributed in order to ensure the safe, expeditious and orderly flow of air traffic.
2.
  - A simulated aerodrome control emergency situation is assessed in terms of its impact on the maintenance of the safe, expeditious and orderly flow of air traffic.
  - Responses to an aerodrome control emergency situation are formulated to reduce their impact on the safe, expeditious and orderly flow of air traffic.
  - Range: Aerodrome control emergency situation can be real or a simulated.
  - Laid down radio telephony procedures are applied during a simulated aerodrome control emergency situation.
  - Emergency procedures are activated in accordance with promulgated organisational procedures during a simulated aerodrome control emergency situation.
  - Range: Emergency procedures include but are not limited to the application of pyrotechnic and light signals and deployment of rescue services.
3.
  - An aerodrome control environment change of watch is conducted in order to determine the air traffic control facilities readiness for operations.
  - Range: Aerodrome control environment includes but is not limited to runway inspection, radio checks, equipment inspections, self readiness.
  - Range: Change of watch includes opening, closing, handing-over, taking over watch, after hour duties, and closure of airfield.
  - Aerodrome ground traffic is directed to ensure the safe, expeditious and orderly flow of traffic.
  - Range: Ground traffic includes but is not limited to vehicles, aircraft and working parties.
  - Aerodrome airborne traffic is directed in order to ensure its safe, expeditious and orderly flow.
  - Communication coordination is conducted in accordance with laid down procedures in order to ensure the safe, expeditious and orderly flow of air and ground traffic.
  - Radio telephony is conducted in accordance with regulatory procedures.
4.
  - Quality management systems are implemented and reviewed to ensure optimal operations.
  - Quality management principles, tools and processes are utilised to measure team performance and deliver organisational objectives.
  - Communication techniques are selected and applied in accordance with the needs of target audience.
  - Range: Communication techniques include advanced, written or oral techniques required when working in a supervisory and/or senior technical capacity in an organisation.

- Organisational information is researched to find air traffic management solutions.

#### Integrated Assessment:

Formative assessments conducted during the learning process will consist of written assessments, simulation in a practical environment and a number of self-assessments

Summative assessment consists of written assessments, assignments and simulation in a practical environment, integrating the assessment of all unit standards and embedded knowledge. Summative assessments is only conducted once the learner has demonstrated proficiency during formative assessment.

In particular assessors should check that the learner is able to demonstrate the ability to consider a range of options and make decisions about:

- Air traffic service that is executed safely, expeditiously and effectively.
- The quality of the observed practical performance as well as the theory and embedded knowledge behind it.
- The different methods that can be used by the learner to display thinking and decision making in the demonstration of practical performance.
- Reflexive competencies.

#### Assessment practices:

- Assessment of the learner shall be conducted in compliance with International Civil Aviation Organisation (ICAO) guidelines, Civil Aviation Authority (CAA) or Military Aviation Authority (MAA) Regulations.
- Knowledge of TRM elements may be assessed through written, oral or practical assessments.
- TRM is integral to flight and flight safety. Procedural elements of TRM are to be assessed throughout the assessment of all outcomes in a holistic and integrated way and therefore should not be assessed as a stand-alone element.
- Range of procedural elements include but are not limited to: Use of checklists, shift briefings, radio transmissions, and coordination.
- Emergencies:
  - Assessment of the learner in emergency and abnormal operations shall be conducted using simulated emergency and abnormal situations.
  - Assessment of the learner in simulated emergencies should be terminated at a point where successful outcome can be judged, and safe recovery to normal conditions can be achieved.
- Assessment:
  - Assessments shall be carried out with the learner acting in controller and non-controller roles.
  - The assessment is carried out with reference to the operator's standard operating procedures.
  - The learner is expected to demonstrate competency in performing appropriate procedures without all the required resources available.
  - Learners will be assessed in their ability to deal with simulated abnormal situations.

#### **INTERNATIONAL COMPARABILITY**

As with other aviation related learning programmes the contents is governed by the International Civil Aviation Organisation (ICAO) and several regional or national agencies such as Federal Aviation Authority (FAA) (USA), Joint Aviation Authority (JAA) (Europe) and Civil Aviation Authority. (CAA). In many instances the competencies are offered in loose standing learning programmes presented as modules for easy integration into aviation occupational training programmes. These serve the same purpose as unit standards developed for the NQF. The advantage of South African qualifications and unit standards is that they provide for a holistic approach to the learner ensuring the development of the whole person as compared to just being able to do a specific task. Research on the NZQF showed a remarkable resemblance with the proposed NQF ATC related qualifications. It does, however, seem that the NZQF unit standards are more of a task nature rather than outcomes based. During the international

comparison no other qualifications as such were found, however, the existence of many learning programmes were evident.

The local aviation authority, CAA, has built up a relationship with many African countries to the extent that most of those countries send their future ATCs to South Africa for training. Zimbabwe is the exception to the rule and maintains its own training capability through the years. Information is shared between the South African and Zimbabwean authorities whilst the training is presented independently.

The international comparison thus focuses on those countries or regions that are governed by the same international agreements, namely the USA, Europe and Zimbabwe, Asia (Thailand), Australia and New Zealand.

In all instances it was found that their learning programmes lacked a formal fundamental base i below NQF Level 5. Except for New Zealand, it could not be determined whether levels of complexity had any significance to those countries.

As far as the core of the qualifications are concerned it was found that the contents were very similar. Differences were in the areas of skills such as first aid in the New Zealand qualification and skills specific to the environment such as cold weather operation of aircraft in the **USA**, which is not applicable to South Africa.

The USA training providers also seem to provide short courses as opposed to qualifications. An example is drawn from the Pan Am International Flight Academy (PAIFA) <http://www.panamacademy.com/airtraffic.asp>, which reads as follow:

• "Air traffic agencies from around the world depend on PAIFA to provide training to their air traffic professionals. Annually, these agencies enroll 500 to 1,000 students in the Academy's comprehensive ATC program. From basic to advanced courses, PAIFA provides specialized ATC and Aviation English classes within your budget and schedule requirements."

Standard and custom-designed courses are taught by experienced, motivated air traffic controllers and instructors.

Courses include:

- Initial/Basic Air Traffic Control.
- Tower/Aerodrome Control.
- Safety Management.
- Quality Assurance.
- Aeronautical Information Services (AIS)
- TC PC Skills.
- Aviation English.

Zimbabwe:

In terms of the Zimbabwean learning programme it was somewhat more difficult to make the comparison as the Zimbabwean programme is curriculum based compared to the South African unit standard based qualification.

ICAO Course **052** (ATC Licence & Aerodrome Control Training):

- Introduction; 3 hrs.
- Air Law (LAW); 15 hrs.
- Air Traffic Services (ATS); **24** hrs.
- Communications (COM); **14** hrs.
- Flight Navigation (NAV); 35 hrs.

- Meteorology (MET); 25 hrs.
- Aerodrome Control (ADC); 18 hrs

ADC Simulator Training (SIM):

- Briefings; 24 hrs.
- Debriefings; 12 hrs.
- Time per student; 36 hrs.
- Human Factors is now an examinable subject; 35 hrs.

New Zealand:

It is only the New Zealand qualification that makes reference to special outcomes in training similar to the South African ATC qualifications that refer to specialisation in the elective component. The New Zealand qualifications, as in the case of the South African qualifications, are also closely linked to the licensing requirements.

Diploma of Air Traffic Control (Aerodrome and Approach Control Rating):

Air Traffic Control:

- Level: 7.
- Credit: 271

Entry requirements:

- Applicants must have met the Airways psychometric and operational selection criteria

Outcome statement:

People completing this qualification are able to demonstrate knowledge of aerodrome and approach control procedures in accordance with the **Airways** Manual of Air Traffic Services and AIPNZ, operate as a safe, reliable, independent air traffic controller in a variable and dynamic aerodrome and approach control environment, manage the personal and situational demands placed on an air traffic controller (ATC), take full responsibility and be accountable for their part in safe and expeditious traffic operations and consider and respond to the interpersonal factors that impact on an operational team dependent on specific and perceived workload and limitations.

Content:

Study includes ATS Licensing subjects; aerodrome control (simulated); ATC skills; approach control (simulated); aerodrome control rating and validation; approach control rating and validation.

Diploma of Air Traffic Control (Aerodrome Control Rating):

Air Traffic Control:

- Level: 7.
- Credit: 196.

Entry requirements:

- Applicants must have met airways psychometric and operational selection criteria

Outcome statement:

Source: National Learners Records Database

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People completing this qualification are able to demonstrate knowledge of aerodrome procedures in accordance with the Airways Manual of Air Traffic Services and AIPNZ, operate as safe, reliable, independent air traffic controllers in a variable and dynamic aerodrome environment, manage the personal and situational demands placed on an air traffic controller, take full responsibility and be accountable for their part in safe and expeditious traffic operations and consider and respond to the interpersonal factors that impact on an operational team dependent on specific and perceived workload and limitations.

Content:

Study includes ATS licensing subjects; aerodrome control (simulated); ATC skills; approach control (Simulated); aerodrome control rating and validation.

Thailand:

- Centre for CATC.
- Bangkok.
- Duration: **17 weeks**

Purpose of the Course:

To provide students with basic knowledge and experience within Air Traffic Control **so** that he or she can continue with course STP 053/47/ATCNR (Approach Control non radar) and, after that, continue with Area Control Course followed by On the Job Training at an Air Traffic Control unit in order to become a licensed Air Traffic Controller after successfully completing training.

Objectives:

Given lectures and practical training in an Air Traffic Control Tower simulator, student will have sufficient knowledge of ATC **license** and aerodrome control to meet the standards prescribed in ICAO Annex 1, Personnel Licensing.

Target Population:

Students graduated from high school without any experience within the field of Air Traffic Control or students with military background (equal to high school) and foreign students with similar background and/or some experience of work within the field of aviation.

Prerequisites:

- High school education or equivalent, or favourable experience and knowledge of aviation profession.
- Proficiency in both written and spoken English.
- Have medical fitness as specified in ICAO Annex 1, Personnel Licensing.

Course Content:

List of Modules; Duration:

- Aerodromes; **5 hours**.
- Aircraft, Wake Turbulence and Aircraft Designators; **6 hours**.
- Airspace, ATS/ATC Organisation; **4 hours**.
- Spelling Alphabet, Codes and Indicators; **9 hours**.
- Basic Meteorology and Altimetry; **10 hours**.
- **Rules of the Air & Basic (radio) Navigation; 16 hours.**
- **Flight Plans & Flight Progress Strips for Arriving Aircraft; 6 hours.**



- General Communication Procedures; 10 hours.
- Control of Arriving Aircraft, RWY-in-Use; 7 hours.
- Control of Taxiing Aircraft; 4 hours.
- Control of Arriving IFR Traffic; 38 hours.
- Control of VFR Traffic; 29 hours.
- Flight Progress Strips for Departing Aircraft; 5 hours.
- ATC Clearances; 5 hours.
- Push-back and Start -Up Control of Departing Aircraft; 38 hours.
- AIS, ATIS, MET Messages and NOTAMs; 15 hours.
- Control of Departing Traffic; 38 hours.
- Control of Arriving IFR/VFR Traffic Forward Information; 38 hours.
- Aeronautical Ground Lights; 5 hours.
- Control of Departing IFR/VFR Traffic; 37 hours.
- Control of Vehicles and Personnel; 39 hours.
- Helicopter Traffic; 27 hours.
- Aircraft Making Touch-and-Go Landings; 51 hours.
- Wind Shear; 5 hours.
- Emergencies and Abnormal Situations; 36 hours.
- Military Procedures; 27 hours.

All modules or parts thereof in the Thailand Advanced Air Traffic Control training course are similar to the content of the National Certificate: Aerodrome Control NQF Level 5.

Australia:

Diploma of Transport and Distribution (Air Traffic Control):

- TDAE103A; Maintain aircraft radio communications.
- TDAE203A; Use air traffic control communication procedures.
- TDAF103A; Manage human factors in aircraft flight.
- TDAF603A; Respond to abnormal and emergency situations within the aircraft.
- TDAG103A; Work professionally in an air traffic control workplace.
- TDAW1203; Manage air traffic service information displays and ancillary information.
- TDAW1303A; Operate air traffic control workstation.
- TDAY2003A; Provide airspace-specific services.
- TDAY2103A; Maintain separation.
- TDAY2203A; Manage traffic.
- TDAZ203A; Perceive traffic and environment information.
- TDAZ303A; Interpret and evaluate traffic and environment.
- TDAZ403A; Prioritise, project and plan tasks and events.
- TDAZ503A; Manage basic situation awareness in the aviation workplace.

The key difference in comparison with the SA qualification (and the NZ) is that this qualification (Australian) makes no distinct provision for specialisation in any of the Air Traffic Control/Support services field. It is therefore pitched somewhat higher than the proposed qualification. The 14 modules or part thereof in the Australian Diploma of Transport and Distribution (Air Traffic Control) are seemingly similar to the content of the National Certificate: Aerodrome Control NQF Level 5.

Europe:

Access to European qualifications proved difficult, as there is currently very little in the public domain. The CATC (centre for air traffic control) courses include an 'ATC Licence and Aerodrome Control' course.

4s with the pilot qualifications it was decided to follow the ICAO standards, as this would not only govern the training but also the licensing of ATCs.

#### ICAO Standards:

The ICAO Standards was adopted as the minimum base line and the ICAO recommendations as guidance to further develop the relevant unit standards. In this regard unit standards, where relevant, reflect the ICAO standards as purpose and range statement.

The following sections of ICAO documentation were considered:

General Rules Concerning Pilot Licences and Ratings - Annex 1; Licences and Ratings for Personnel other than Flight Crew Members - Annex 1; Rules of The Air - Introduction - Annex 2; Rules of The Air - General - Annex 2; Distress and Urgency Signals - Annex 2; Interception of Civil Aircraft - Annex 2; Meteorological Service - Definitions and Introduction - Annex 3; Aircraft Observations and Reports - Annex 3; Service for Operators and Flight Crew Members - Annex 3; information for Air Traffic Services - Annex 3; Operation of Aircraft - Definitions and Introduction - Annex 6; Operation of Aircraft - Flight Operations - Annex 6; Operation of Aircraft - Operating Limits - Annex 6; Operation of Aircraft - Flight Crew - Annex 6; Operation of Aircraft - Dispatcher - Annex 6; Operation of Aircraft - Cabin Crew - Annex 6; Operation of Aircraft - Operations Manual - Annex 6; Operation of Aircraft - Extended Range Operations - Annex 6; Operation of Aircraft - Flight Preparations - Annex 6 Part II; Operation of Aircraft - Carriage of Oxygen - Annex 6; Operation of Helicopters - General Operations - Annex 6 Part III; Operation of Helicopters - Performance - Annex 6 Part III; Operation of Helicopters - Crew - Annex 6 Part III; Operation of Helicopters - Dispatcher - Annex 6 Part III; Operation of Helicopters - Cabin Crew - Annex 6 Part III; Operation of Helicopters - Operations Manual - Annex 6 Part III; Communication Procedures - Definitions And Introduction - Annex 10 Vol II; Communication Procedures - Aeronautical Fixed Service - Annex 10 Vol II; Communication Procedures - Mobile Service - Annex 10 Vol II; Communication Procedures - Data Link - Annex 10 Vol II; Communication Procedures - Annex 10 Vol II; Air Traffic Control - Definitions And Introduction - Annex 11; Air Traffic Control - Air Traffic Control Service - Annex 11; Air Traffic Control - Flight Information Service - Annex 11; Air Traffic Control - Alerting Service - Annex 11; Air Traffic Control - TIBA - Annex 11; Search and Rescue - Definitions And Introduction - Annex 12 AND Search and Rescue - Operating Procedures - Annex 12.

#### Conclusion:

The contents of the National Certificate: Aerodrome Control compares favourably with the two qualifications provided by New Zealand who use the same systems and apply the same practices as South Africa. Similarly, this South African qualification compares well with vocational learning presented by the USA; also considering that the USA is a major international air traffic service provider that controls high traffic volumes. Likewise countries in Asia have comparable learning programmes. This is also the case when considering the Zimbabwean curriculum based programme. Within the African continent South Africa is regarded as one of the leaders in the Air Traffic Control field, considering that learners from most Sub-Saharan and SADEC Countries are trained by South African agencies.

This qualification and unit standards provide for a holistic approach to the learner ensuring the development of the whole person as compared to the others which focus on a more narrow occupational approach.

#### **ARTICULATION OPTIONS**

This qualification has horizontal articulation with the following qualifications:

- ID 49950: National Certificate: Navigation, NQF Level 5.
- ID 58023: National Diploma: Aircraft Piloting, NQF Level 5.

This qualification has vertical articulation with the following qualifications:

- ID 58008: National Diploma: Aircraft Piloting, NQF Level 6.
- Bachelor of Commerce: Aviation Management, NQF Level 6
- ID 58579: National Diploma: Air Traffic Control. NQF Level E

#### **MODERATION OPTIONS**

- Moderation of learner achievements takes place at providers accredited by the applicable ETQA for the provision of programmes that result in the outcomes specified for the "National Certificate in Aerodrome Control - NQF Level 5".
- Anyone moderating the assessment of a learner against this Qualification must be registered as a moderator with the relevant ETQA. Any institution offering learning that will enable the achievement of this Qualification must be accredited as a provider with the relevant ETQA.
- Moderation must include both internal and external moderation of assessments at exit points of the Qualification, unless ETQA policies specify otherwise. Moderation should also encompass achievement of the competence described both in individual Unit Standards as well as the integrated competence described in the Qualification.

#### **CRITERIA FOR THE REGISTRATION OF ASSESSORS**

For an applicant to register as an assessor, the applicant needs:

- A minimum of two years relevant occupational experience.
- Well-developed interpersonal skills, subject matter and assessment experience.
- Well-developed aviation subject matter expertise.
- A qualification in aviation at NQF Level 6.
- To be a registered assessor with the relevant Education and Training Quality Assurance Body.

#### **NOTES**

- Communication Level 4 ideally in ICAO defined English in accordance with South African Civil Aviation Authority requirements.
- Learners who are not competent in the language proficiency standard for ICAO defined operational English at ICAO Level 4 will find it difficult to meet licensing requirements.

Definitions:

**Aircraft:** Any machine that can derive support in the atmosphere from the reaction of the air against its surface.

**Air Traffic Management:**

**ICAO English:**

The International Civil Aviation Organisation (ICAO) requires that all applicants for a pilots licences, all current pilot licence holders, Air Traffic Controllers and Station Operators Licences shall demonstrate, in a manner acceptable to the licensing authority, the ability to speak and understand the English language used for radiotelephony communications in compliance with the holistic descriptions contained in the ICAO Operational Level (Level 4) of the ICAO Language Proficiency Rating Scale Document

**ICAO Operational Level 4 English:**

- Pronunciation (Assumes a dialect and/or accent intelligible to the aeronautical community): Pronunciation, stress, rhythm and intonation are influenced by the first language or regional variation but only sometimes interfere with ease of understanding

a Structure (Relevant grammatical structures and sentence patterns): Basic grammatical structures and sentence patterns are used creatively and are usually well controlled. Errors may occur, particularly in unusual or unexpected circumstances, but rarely interfere with meaning.

- Vocabulary: Vocabulary range and accuracy are usually sufficient to communicate effectively on common, concrete and work related topics. Can often paraphrase successfully when lacking vocabulary in unusual or unexpected circumstances.

- Fluency: Produces stretches of language at an appropriate tempo. There may be occasional loss of fluency on transition from rehearsed or formulaic speech to spontaneous interaction, but this does not prevent effective communication. Can make limited use of discourse markers or connectors. Fillers are not distracting.

- Comprehension: Comprehension is accurate on common, concrete and work related topics when the accent or variety used is sufficiently intelligible for an international community of users. When the speaker is confronted with a linguistic or situational complication or an unexpected turn of events, comprehension may be slower or require clarification strategies.

- Interaction: Responses are usually immediate, appropriate and informative. Initiates and maintains exchanges even when dealing with an unexpected turn of events. Deals adequately with apparent misunderstandings by checking, confirming or clarifying.

#### Terms, Definitions and Abbreviations:

a ADS service: A service using aircraft information provided by means of automatic dependant surveillance.

- Advisory airspace: Airspace of defined dimensions, or designated route, within which air traffic advisory service is available.

- Aerodrome: A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

- Aerodrome control service: Air Traffic Control service for aerodrome traffic.

- Aerodrome control tower: A unit established to provide air traffic control service to aerodrome traffic.

- Aerodrome traffic: All traffic on the manoeuvring area of an aerodrome and all aircraft flying in the vicinity of an aerodrome.

- Aerodrome flight information service (AFIS): A service provided by a radio operator on behalf of the ATS.

- Aeronautical information publication (AIP): A publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation.

- Airborne collision avoidance system (ACAS): An aircraft system based on secondary surveillance radar (SSR) transponder signals that operate independently of ground-based equipment to provide advice to the pilot on potential conflicting aircraft that are quick with SSR transponders.

- Aircraft: Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against earth's surface.

- Air-ground communications: Two-way Communications between aircraft and station or locations on the surface of the earth.

- Air report (AIREP): A report from an aircraft in flight prepared in conformity with requirements for position and operational and/or meteorological reporting.

- Air traffic: All aircraft in flight or operating on the manoeuvring area of an aerodrome.

- Air traffic advisory service: Service provided within advisory airspace to ensure separation, in so far as practical between aircraft which are operating on IFR flight plans.

- Air traffic control clearance: Authorisation for an aircraft to proceed under conditions specified by an Air Traffic Control Unit.

- Air traffic control instruction: Directives issued by air traffic for the purpose of requiring a pilot to take a specified action.

- Air traffic control service: A service provided for the purpose of:
  - Preventing collisions; between aircraft, on the manoeuvring area between aircraft and obstructions.
  - Expediting and maintaining an orderly flow of air traffic.
- Air traffic control unit: A generic term meaning variously, area control centre, approach control unit or aerodrome control tower.
- Air traffic flow management (ATFM): The service established with the objective of contributing to a safe, orderly and expeditious flow of Air Traffic by ensuring that ATC capacity is utilised to the maximum extent possible, and that the traffic volume is compatible with the capacities declared by the appropriate ATS authority.
- Air traffic management (ATM): The dynamic, integrated management of air traffic and airspace -safely, economically and efficiently - through the provision of facilities and seamless services in collaboration with all parties.
- Air traffic service (ATS): A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).
- Air traffic services unit (ATSU): A generic term meaning variously, air traffic control unit, flight information centre or air traffic services reporting office.
- Air traffic services airspaces: Airspaces of defined dimensions, alphabetically designed, within which specific types of flights may operate and for which air traffic services and rules of operation are specified.
- Airway: A control area or portion thereof established in the form of a corridor.
- Alerting service: A service provided to notify appropriate organisations regarding aircraft in need of search and rescue aid, and assist such organisations as required.
- Alphanumeric characters: A collective term for letters (Alphanumerics) and figures (digits).
- Area control service: A service for controlled flights in control areas.
- Approach control service: A service for arriving and departing controlled flights.
- Area control centre (ACC): A unit established to provide ATC Service to controlled flights in controlled airspace and advice and information to other flights under its jurisdiction.
- Area navigation (RNAV): A method of navigation which permits aircraft operation on any desired flight path within the coverage of station-referenced navigation aids or within the limits of the capability of self-contained aids, or a combination of this.
- Area navigation route: An ATS route established for the use of aircraft capable of employing area navigation.
- Approach control unit: A unit established to provide ATC Service to controlled flights arriving at, or departing from, one or more aerodromes.
- Aerodrome control unit: A unit established to provide air traffic control service to aerodrome traffic.
- Appropriate ATS authority: The relevant authority designated by the State responsible for providing air traffic service in the airspace concerned.
- Apron: A defined area, on a land aerodrome intended to accommodate aircraft for the purpose of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance.
- ATS surveillance service: Term used to indicate a service provided directly by means of an ATS surveillance system.
- ATS surveillance system: A generic term meaning variously, ADS-B, PSR, SSR or any comparable ground-based system that enables the identification of aircraft.
- Automatic terminal information services (ATIS): The provision of current, routine information to arriving and departing aircraft by means of continuous and repetitive broadcasts throughout the day or a specified portion thereof.
- Control area: A controlled airspace extending upwards from a specified limit above the earth.
- Controlled aerodrome: An aerodrome at which air traffic control service is provided to aerodrome traffic.
- Controlled airspace: An airspace of defined dimensions within which air traffic controlled services is provided in accordance with the airspace classifying.
- Controlled flight: Any flight that is subject to an air traffic control clearance.
- Controller-pilot data link communications (CPDLC): A means of communication between controller and pilot, using data link for ATC communications.

a Control zone: A controlled airspace extending upwards from the surface of the earth to a specified upper limit.

- Data processing: A systematic sequence of operations performed on data.
- Error: An action or inaction by an operational person that leads to deviations from organisational or operational person intentions or expectations.
- Error management: The process of detecting and responding to errors with countermeasures that reduce or eliminate the consequences of errors, and mitigate the probability of further errors or undesired states.
- Estimated time of arrival (ETA): For IFR flights, the time at which it is estimated that the aircraft will arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or, if no navigation aid is associated with the aerodrome, the time at which the aircraft will arrive over the aerodrome. For VFR flights, the time at which it is estimated that the aircraft will arrive over the aerodrome.
- Expected approach time (EAT): The time at which ATC expects that an arriving aircraft, following a delay, will leave the holding point to complete its approach for a landing.
- Filed flight plan (FPL): The flight plan as filed with an ATS unit by the pilot or his designated representative, without any subsequent changes.
- Flight information service: A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.
- Flight level: Surfaces of constant atmospheric pressure, which is related to a specific pressure datum 1013.2 Hectopascal (hPa) and is separated from other such surfaces by specific pressure intervals.
- Flight plan: Specified information provided to Air Traffic Service units relative to the intended flight or portion of a flight of an aircraft.
- Flow control: Measures designated to adjust the flow of traffic into a given airspace, along a given route, or around for a given aerodrome, so as to ensure the most effective utilisation of the airspace.
- Forecast: A statement of expected meteorological conditions for a specified time or period, and for a specified area or portion of airspace.
- Heading: The direction in which the longitudinal axis of an aircraft is pointed, usually expressed in degrees from North (true, magnetic, compass or grid).
- Height: The vertical distance of a level, a point or an object considered as a point, measured from a specified datum.
- Holding procedure: A pre-determined manoeuvre which keeps an aircraft within a specified airspace while awaiting further clearance.
- Human factors: Are specifically related to people in their living and working situations, about their relationship with machines, procedures and with their environment and their relationships with other people both individually and in groups.
- IFR flight: A flight conducted in accordance with the instrument flight rules.
- Incident: An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.
- Instrument approach procedures (IAP): A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route, to a point from which a landing can be completed and, thereafter, if a landing is not completed, to a position at which holding or en-route obstacle criteria apply.
- Instrument meteorological conditions (IMC): Meteorological conditions expressed in terms of visibility, distance from cloud and ceiling, **less** than the minima specified for visual meteorological conditions.
- International NOTAM office: An office designated by a State for the exchange of NOTAM internationally.
- Level: A generic term relating to the vertical position of an aircraft in flight and meaning variously height, altitude or flight level.
- Manoeuvring area: That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons.
- Meteorological information: Meteorological report, analysis, forecast and any other statement relating to existing or expected meteorological conditions.

- Meteorological report: A statement of observed meteorological conditions related to a specified time and location.
- Missed approach procedure: The procedure to be followed if the approach cannot be continued.
- NOTAM: A notice distributed by means of telecommunications containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.
- Obstacle clearance altitude/ height (OCA/H): The lowest altitude (OCA), or alternatively, the lowest height above the elevation of the relevant runway threshold, or above the aerodrome elevation, as applicable (OCH), used in establishing compliance with the appropriate obstacle clearance criteria.
- Onward clearance time (OCT): The time at which it is expected that an aircraft which has been instructed to hold during the en-route phase of flight will be cleared to resume its flight.
- Precision approach radar (PAR): Primary radar equipment used to determine the position of an aircraft during final approach, in terms of lateral and vertical deviations relative to a nominal approach path, and in range relative to touchdown.
- Primary radar: A radar system which uses reflected radio signals.
- Primary surveillance radar (PSR): A surveillance radar system which uses reflected radio signals.
- Radar: A radio detection device which provides information on range, azimuth and/or elevation of objects.
- Radar approach: An approach, executed by an aircraft, under the direction of a radar controller.
- Radar control: Term used to indicate that radar-derived information is employed directly in the provision of air traffic control service.
- Radar controller: A qualified air traffic controller holding a radar rating appropriate to the functions to which he is assigned.
- Radar display: An electronic display of radar derived information depicting the position and movement of aircraft.
- Radar handover: Transfer of responsibility for the control of an aircraft between two controllers using radar, following identification of the aircraft by both controllers.
- Radar identification: The situation which exists when the radar position of a particular aircraft is seen on a radar display and positively identified by the radar controller.
- Radar monitoring: The use of radar for the purpose of providing aircraft with information and advice relative to significant deviations from the nominal flight path, including deviations from the terms of the air traffic control clearances.
- Radar position indication (RPI): The visual indication, in non-symbolic and/or symbolic form, on a radar display of the position of an aircraft obtained by primary and/or secondary surveillance radar.
- Radar position symbol (RPS): The visual indication, in symbolic form, on a radar display of the position of an aircraft obtained after automatic processing of positional data derived from primary and/or secondary surveillance radar.
- Radar separation: The Separation used when aircraft position information is derived from radar sources.
- Radar services: Term used to indicate a service provided directly by means of radar.
- Radar vectoring: Provision of navigational guidance to aircraft in the form of specific headings, based on the use of radar.
- Reporting point: A specified geographical location in relation to which the position of an aircraft can be reported.
- Required navigation performance (RNP): A statement of the navigation performance necessary for operation within a defined airspace.
- Runway: A defined rectangular area, on a land aerodrome prepared for the landing and take-off of aircraft.
- Runway visual range (RVR): The range over which the pilot of an aircraft on the centre line of a runway can see the runway's surface marking or the lights delineating the runway or identify its centre line.

- **Runway incursion:** Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and takeoff of aircraft.
- **Secondary radar:** A radar system wherein a radio signal transmitted from the radar station initiates the transmission of a radio signal from another station.
- **Secondary surveillance radar (SSR):** A surveillance radar system which uses transmitters/receivers (interrogators) and transponders.
- **Special VFR flight:** A VFR flight cleared by air traffic control to operate within a control zone under meteorological conditions below the VMC.
- **Standard instrument arrival (STAR):** A designated instrument flight rule (IFR) arrival route linking a significant point, normally on an ATS route, with a point from which a published instrument approach procedure can be commenced.
- **Standard instrument departure (SID):** A designated instrument flight rule (IFR) departure route linking the aerodrome or a specified runway of the aerodrome with a specified significant point, normally on a designated ATS route, at which the on-route phase of a flight commences.
- **Surveillance radar:** Radar equipment used to determine the position of an aircraft in range and azimuth.
- **Taxiing:** Movement of an aircraft on the surface of an aerodrome under its own power, excluding take-off and landing.
- **Taxiway:** A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another, including:
  - **Aircraft stand taxi lane:** A portion of an apron designated as a taxiway and intended to provide access to aircraft stands only.
  - **Apron taxiway:** A portion of a taxiway system location an apron and intended to provide a through taxi route across the apron.
  - **Rapid exit taxiway:** A taxiway connected to a runway at an acute angle and designated to allow landing aeroplanes to turn off at higher speeds than are achieved on other exit taxiways and thereby minimising runway occupancy times.
- **Track:** The projection on the earth's surface of the path of an aircraft, direction of which the path at any point is usually expressed in degrees from North (true, magnetic or grid).
- Team resource management:** Strategies for the best use of all available resources that include information, equipment and people to optimise safety and efficiency within a specific work environment.
- **Traffic information:** information issued by an Air Traffic Services unit to alert a pilot to other known or observed air traffic which may be in proximity to the position or intended route of flight and to help the pilot avoid a collision.
- **Transfer of control point:** A defined point located along the flight path of an aircraft, at which the responsibility for providing air traffic control service to the aircraft is transferred from one control unit or control position to the next.
- **VFR flight:** A flight conducted in accordance with the visual flight rules.
- **Visibility:** Visibility for aeronautical purposes is the greater of:
  - The greatest distance at which a black object of suitable dimensions, situated near the ground, can be seen and recognised when observed against a bright background.
  - The greatest distance at which lights in the vicinity of 1000 candelas can be seen and identified against an unlit background.
- **Visual approach:** An approach by an IFR flight when either part or all of an instrument approach procedure is not completed and the approach is executed with visual reference to terrain.
- **Visual meteorological conditions (VMC):** Meteorological conditions expressed in terms of visibility, horizontal and vertical distance from cloud ceiling, equal to or better than the specified minima.
- **Way-point:** A specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation, either:
  - **Fly-by waypoint:** A way point which requires turn anticipation to allow tangential interception of the next segment from a route or procedure.
  - **Flyover way point:** A way point which a turn is initiated in order to join the next segment of a route or procedure.



- ALARP: As low as reasonably practicable.
- ASR: Air safety report.
- ARMA: Africa Indian Ocean Regional Monitoring Agency.
- ATCI: Manual: Air traffic control instruction manual.
- ARCC: Aeronautical rescue co-ordination centre.
- ATMSD: Air traffic management service delivery.
- ASD: Air situation display.
- ATSPL: Air traffic service personnel licensing.
- ACC: Area control centre.
- ACAS: Airborne collision avoidance system.
- ADC: Air data computer.
- ADF: Automatic direction finding.
- ADR: Advisory route.
- ADS: Automatic dependent surveillance.
- ADS-B: Automatic dependant surveillance broadcast.
- ARINC: Aeronautical radio incorporated.
- AFIS: Aerodrome flight information service.
- AFISU: AFIS Unit.
- AFS: Aeronautical Fixed Service.
- AFTN: Aeronautical fixed telecommunications network.
- AH: Artificial horizon.
- ATNS: Air Traffic and Navigation Services.
- e AFI: African-Indian Ocean region.
- AAD: Assigned altitude deviation.
- e AOC: Aircraft operating certificate.
- ASE: Altimetry system error.
- ATC: Air traffic control.
- e ATCU: Air traffic control unit.
- ATD: Actual time of departure.
- e ATFM: Air traffic flow management.
- ATIS: Automatic terminal information service.
- ATS: Air Traffic Services.
- ATM: Air traffic management.
- ATSU: Air traffic service unit.
- ATN: Aeronautical telecommunication network.
- AMSS: Aeronautical mobile satellite system.
- ATZ: Aerodrome Traffic Zone.
- AWY: Airway.
- APIRG: African planning and implementation regional group.
- e CAA: Civil Aviation Authority.
- CAR: Civil Aviation Regulations.
- CATS: Civil Aviation Technical Standards.
- c/s: Callsign.
- CPDLC: Controller-Pilot Data Link Communications.
- e CTA: Control Area.
- CVOR: Conventional very high frequency omni-directional range
- CNS: Communication. Navigation and Surveillance.
- CTR: Control Zone.
- DR: Dead reckoning.
- CRM: Collision Risk Model.
- DEP: Depart, Departure or Departed.
- DLA: Delay or Delayed.
- DIF: Direction finding.
- DME: Distance measuring equipment.
- DVOR: Doppler very high frequency omni-directional range.

- DGT: Department of Transport.
- DAIW: Danger area infringement warning.
- EAT: Expected Approach Time.
- ETA: Expected Time of Arrival.
- ETD: Expected Time of Departure.
- FIM: Flight information manual.
- EICAS: Engine indication and crew alerting system.
- FMC: Flight Management Computer.
- FANS: Future air navigation system.
- FIR: Flight Information Region.
- FL: Flight Level.
- FLAS: Flight level allocation system.
- FDP: Primary flight display.
- FOM: Figure of Merit.
- FPL: Flight Plan.
- ft: Feet.
- GCA: Ground Controlled Approach.
- GNSS: Global navigation satellite system.
- GPS: Global positioning System.
- GMU: GPS monitoring unit.
- HMU: Height monitoring unit.
- GAT: General air traffic.
- HF: High Frequency.
- hPa: Hectopascals.
- ICAO: International Civil Aviation Organisation.
- IAS: Indicated Airspeed.
- IFR: Instrument Flight Rules.
- ILS: Instrument Landing System.
- IMC: Instrument MET Conditions.
- INS: Inertial navigation system.
- IRS: Inertial Reference System.
- km: Kilometre(s).
- kts: Knots.
- MAA: Military Aviation Authority.
- MLS: Microwave landing system.
- MASPS: Minimum aviation system performance standards.
- MEL: Minimum equipment list.
- MFD: Multi-function display.
- MNPS: Minimum navigation performance specifications.
- MSAW: Minimum safe altitude warning.
- MTCA: Medium term conflict alert.
- MET: Meteorological.
- NOTAM: Notices to airmen.
- ND: Navigation display.
- NAT: North Atlantic region.
- NDB: Non-Directional Radio Beacon.
- NM: Nautical Mile.
- OCNH: Obstacle Clearance Altitude/Height.
- OCT: Onward Clearance Time.
- OAT: Operational air traffic.
- PSR: Primary surveillance radar.
- PAPI: Precision Approach Path Indicator.
- PPI: Plan position indicator.
- QDM: Magnetic heading.
- QDR: Magnetic bearing.
- QFE: Atmospheric pressure at airfield elevation (on runway threshold)

- QNH: Altimeter subscale setting to obtain elevation when on the ground.
- RCF: Radio Communication Failure.
- RT: Radiotelephony.
- RDP: Radar data processor.
- RMA: Regional monitoring agency.
- RPL: Repetitive flight plans.
- RNAV: Area navigation.
- RNP: Required navigation performance.
- RVR: Runway Visual Range.
- RVSM: Reduced vertical separation minima.
- SVFR: Special visual flight rules.
- SMS: Safety management system.
- SAR: Search and Rescue.
- SID: Standard Instrument Departure.
- SMR: Surface Movement Radar.
- SRA: Surveillance Radar Approach.
- SANDF: South African National Defence Force.
- SAPS: South African Police Services.
- SSR: Secondary Surveillance Radar.
- STAR: Standard Instrument Arrival.
- STCA: Short-term conflict alert.
- THR: Threshold.
- TMA: Terminal Control Area.
- TIBA: Traffic information broadcast alert.
- TAS: True Airspeed.
- TODA: Take-off Distance Available.
- TORA: Take-off Run Available.
- TWR: Aerodrome Control Tower.
- TRM: Team resource management.
- TSI: Turn and slip indicator.
- TLS: Transponder landing system.
- UHF: Ultra High Frequency.
- TVE: Total vertical error.
- UTC: Universal Time Constant (Co-ordinated Universal Time Constant).
- VDF: VHF Direction Finding.
- VFR: Visual Flight Rules.
- VIP: Very important person.
- VSAT: Very small aperture terminal.
- VHF: Very High Frequency.
- VMC: Visual MET Conditions.
- VOR: VHF Omni-Range.
- VORTAC: VOR/tactical air navigation.
- VSI: Vertical speed indicator.
- WAC: World aeronautical charts.
- WGS: World Geodetic System

### UNIT STANDARDS

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
for aerodrome traffic planning				
Core	244194	Perform Air Traffic Service (ATS) shift procedures and administration	Level 5	15

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Core	244199	Conduct air traffic control for traffic combinations on and in the vicinity of an aerodrome	Level 5	15
Core	119033	Implement an Incident Management Plan	Level 5	6
Elective	120476	Adhere to professional conduct and organisational ethics	Level 5	4
Elective	120305	Analyse the role that emotional intelligence plays in leadership	Level 5	8
Elective	114488	Coordinate government communication activities	Level 5	6
Elective	120044	Demonstrate knowledge of Airpower	Level 5	5
Elective	115753	Conduct outcomes-based assessment	Level 5	15
Elective	7876	Conduct on-the-Job-Training	Level 5	8
Elective	11286	Institute disciplinary action	Level 5	8
Elective	119345	Apply principles, regulations and legislation underlying supply chain management in the public sector	Level 5	15
Elective	117392	Conduct a range of audits	Level 5	6
Elective	12156	Apply government communication processes and assess communication effects	Level 5	5
Elective	117988	Apply the Strategic Process during Planning	Level 5	3
Elective	120300	Analyse leadership and related theories in a work context	Level 5	8
Fundamental	243278	Analyse and apply safety principles in aviation	Level 6	5
Fundamental	243325	Apply safety principles for flight operations	Level 5	5
Fundamental	12433	Use communication techniques effectively	Level 5	8
Fundamental	110526	Plan, organise, implement and control record-keeping systems-	Level 5	4
Fundamental	15230	Monitor team members and measure effectiveness of performance	Level 5	4
Fundamental	242706	Analyse problems	Level 5	4