## 22 February 2008



# 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 for public comment.

This notice contains the title, field, sub-field, NQF level, credits, and purpose of the Qualification. The full Qualification can be accessed via the SAQA web-site at <u>www.saqa.org.za</u>. 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 should reach SAQA at the address below and *no later than 20 March 2007.* All correspondence should be marked **Standards Setting – Aerospace Operations** and addressed to

> The Director: Standards Setting and Development SAQA *Attention: Mr. D. Mphuthing* Postnet Suite 248 Private Bag X06 Waterkloof 0145 or faxed to 012 – 431-5144 e-mail: dmphuthing@saqa.org.za

DR. S. BHIKHA DIRECTOR: STANDARDS SETTING AND DEVELOPMENT

No. 212



# SOUTH AFRICAN QUALIFICATIONS AUTHORITY

#### QUALIFICATION: National Diploma: Aeronautical Information Management Practice

SAQA QUAL ID	QUALIFICATION TITLE			
60549	National Diploma: Aeronautical Information Management Practice			
ORIGINATOR		PROVIDER		
SGB Aerospace Operations				
QUALIFICATION TYPE	FIELD	SUBFIELD		
National Diploma	10 - Physical, Mathematical, Computer and Life Sciences	Physical Sciences		
ABET BAND	MINIMUM CREDITS	NQF LEVEL	QUAL CLASS	
Undefined	240	Level 5	Regular-Unit Stds Based	

# This qualification does not replace any other qualification and is not replaced by another qualification.

#### PURPOSE AND RATIONALE OF THE QUALIFICATION Purpose:

The Qualification will enable the qualifying learner the competencies to function within both a national and international AIM context. Upon completion of this qualification the learner will be able to collect, collate, format, disseminate and store quality and timeous aeronautical information in accordance with global standards. It also provides a foundation for further learning in related fields.

This Qualification can be used in the recognition of prior learning process to assess and recognise workplace skills acquired without the benefit of formal education and training. For the new entrant, this Qualification describes the learning outcomes required to participate effectively in a structured workplace. For education and training providers, this Qualification provides guidance for the development of appropriate learning programmes and assessment documentation. For employers, this qualification enables skills gaps to be identified and addressed ensuring that productivity levels are increased and business objectives achieved. The combination of learning outcomes that comprise this Qualification will provide the qualifying learner with vocational knowledge and skills appropriate to the context of Aeronautical Information Management. It will also equip learners with a foundation for further intellectual development, opportunities for gainful employment and reward for contributions to society. This Qualification will provide the Air Traffic Management (ATM) community with qualified AIM Practitioners, thereby facilitating social and economic transformation, empowerment, and upliftment in the Industry and country in general.

The qualifying learner will be able to:

- Demonstrate an understanding of the aviation environment.
- Perform the AIM operational roles and functions in the interest of aviation safety.
- Perform general AIM support roles and functions.
- Perform AIM roles, responsibilities and functions within an integrated management system.

#### Rationale:

Source: National Learners' Records Database

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As a result of new generation aircraft, Global standardization and harmonization in Air Traffic Management, 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.

The rapidly changing environment of Air Traffic Management (ATM), with the requirement to handle ever-increasing flight-critical aeronautical information, has imposed the need for Aeronautical Information Services (AIS) to transcend from a product centric service to a data-centric Aeronautical Information Management (AIM) environment. Appropriately qualified and experienced staff in sufficient numbers are a pre-requisite for an AIM function to provide Quality Assured, Safe and Timely aeronautical information.

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 Aeronautical Information Management Practitioners.

This Qualification will facilitate the development of a professional community specifically for Aeronautical Information who are able to contribute towards a safe and productive ATM/CNS system. Furthermore, this Qualification will ensure quality assured, timeous aeronautical information in support of the aerospace industry. An underlying supposition for the purpose of this Qualification is the notion of effective performance. This necessitates a certain repertoire of knowledge and skills considered as a pre-requisite to effective performance.

This Qualification enables the learners to develop competencies such as self-discipline, critical decision-making, safety, situational awareness, judgement, logical 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 Aeronautical Information Management standards in line with international best practice.

### **RECOGNIZE PREVIOUS LEARNING?**

Y

# LEARNING ASSUMED IN PLACE

- Communication at NQF Level 4.
- Mathematics at NQF Level 4.
- Geography at NQF Level 4.
- Computer Literacy at NQF Level 3.

Recognition of Prior Learning:

The Qualification may be obtained in whole or in part through the process of Recognition of Prior Learning. Learners who may meet the requirements of any Unit Standard in this Qualification may apply for recognition of prior learning to the Relevant ETQA, and will be assessed against the assessment criteria of the exit level outcomes of this qualification and specific outcomes for the relevant Unit Standard/s.

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:

Source: National Learners' Records Database

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Open access: Learners with certain physical (visual, auditory etc) impairments may find it difficult to complete the qualification successfully without meeting certain medical requirements.

#### **QUALIFICATION RULES**

The qualifying learner will achieve this Qualification by complying with the following rules of combination for the accumulation of credits:

Learning Component Credits:

- All fundamental Unit Standards 71.
- All Core Unit Standards 107.
- Elective Unit Standards 62.

Total Credits 240.

Learners may choose to complete an area of specialisation within the elective component of this Qualification. Should learners choose an area of specialisation, they are required to complete all the Unit Standards listed within the specialisation and if any further credits are required to complete the 62 credits for the elective category, these may be chosen from any of the remaining specialised or general elective unit standards.

# EXIT LEVEL OUTCOMES

On completion of this Qualification learners are able to:

1. Demonstrate an understanding of the aviation environment.

2. Perform the AIM operational roles and functions in the interest of aviation safety.

3. Perform general AIM support roles and functions.

• Note: These roles and functions are in support of customer care, change management, financial resource and human resource management.

4. Perform AIM roles, responsibilities and functions within an integrated management system.

# ASSOCIATED ASSESSMENT CRITERIA

Associated Assessment Criteria for Exit Level Outcome 1:

1.1 Legal frameworks related to the ATS environment are identified for interpretation and application purposes.

• Range: Legal framework refers to national and international: statutory requirements, regulations, acts, policies, procedures, agreements.

1.2 The roles and responsibilities of AIM are evaluated by explaining the inter-relationship between aircraft flight systems, aerodrome facilities and aeronautical navigation facilities.1.3 AIM is defined in terms of its roles, responsibilities and functions within the ATM concept.

Associated Assessment Criteria for Exit Level Outcome 2:

2.1 Communication strategies are used to perform operational and co-ordination functions.

• Range: Strategies include but are not limited to structure such as coding and decoding, flow of information, media inter/intra-relationships.

• Range: Strategies include but are not limited to format such as international, national and organisational.

• Range: Strategies include but are not limited to conventions such as measurements, terminology, style, protocols.

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2.2 Meteorological information is interpreted to determine its influence on aeronautical operations.

• Range: Meteorological information include but not limited to synoptic charts, terminal area forecasts (TAF), meteorological area reports (METARS) and significant meteorological phenomena reports (SIGMET).

2.3 Elementary principles of aircraft navigation theory are applied in order to produce aeronautical information for navigational purposes.

• Range: Elementary principles will exclude to the physical piloting of an aircraft.

2.4 Aerodynamic principles of flight are explained to reflect their impact on the physiology of flight.

• Range: Aerodynamic principles include but are not limited to lift, drag, weight, thrust, flight controls, flap systems, energy management.

2.5 Aeronautical and topographical maps and charts are interpreted for the purpose of providing aeronautical information.

2.6 Data management systems are described to reflect their uses, impact on data management, types of systems, features and end user tools.

• Range: Data includes both static and dynamic.

2.7 Team resource management strategies are utilised in support of AIM operational requirements.

Associated Assessment Criteria for Exit Level Outcome 3:

3.1 Communication media are utilized for specific audiences in order to perform AIM operations in accordance with protocols and organizational procedures.

• Range: Communication media include but are not limited to ATN/AFTN, e-mail, facsimile and telephone.

3.2 Responsibilities and functions are performed to reflect adherence to organisational ethics.

• Range: Organizational ethics include but are not limited to professional conduct aspects such as dress code, telephone etiquette, and personal interaction.

3.3 Responsibilities and functions are performed to demonstrate contribution to the achievement of team goals and objectives.

• Range: Contribution could include timeframes, negotiating, standards of the activity.

3.4 Time is managed in order to produce and provide aeronautical information within specified time frames.

3.5 General AIM support roles and functions are performed in accordance with laid down quality procedures.

3.6 Information is disseminated in support of the AIM business environment in accordance with organisational procedures.

• Range: Information includes but is not limited to customer care, change management, financial resource and human resource management.

• Note: Dissemination can be undertaken for clients, stakeholders, roleplayers and interested parties.

3.7 The business environment and its many facets are described to reflect their impact on AIM.

• Range: Facets include but are not limited to type of businesses, ways of operation, structures,

type of industry, generic business processes, corporate culture and regulatory requirements.

Associated Assessment Criteria for Exit Level Outcome 4:

4.1 Quality assurance principles are applied to ensure information integrity in support of aviation safety.

• Range: Principles refer to but is not limited to: organisational and internationally accepted quality related principles embodied by systems such as ISO standards.

4.2 Safety principles are applied in line with the nationally and internationally accepted aviation legal framework.

• Range: Legal framework refers to but is not limited to Acts and Regulations that pertain to the aviation industry.

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• Range: Safety principles refer to but are not limited to aviation safety standards and recommended practices.

4.3 Threat and error management strategies are applied in order to determine possible risk and opportunities which impact on aviation safety.

• Range: Strategies refer to but are not limited to strategies to ensure data integrity, timeliness of information and applicability of information.

• Note: The process of identifying threat and errors refers to a systematic and proactive process that minimises risk to the aviation industry and the public.

4.4 Problem-solving strategies are used to evaluate aviation related problems in order to provide resolutions.

• Range: Problem-solving strategies refer to but are not limited to long and short-term problem solving processes.

4.5 Information is assessed in order to make verifiable findings.

• Note: The assessment of information must reflect applicability, currency, accuracy and integrity.

4.6 Human performance factors are explained in terms of their influence on AIM operations.

• Range: Factors refer to but is not limited to: fatigue, time constraints, environmental influences and cultural diversity.

Integrated Assessment:

Integrated assessment at the level of the Qualification provides an opportunity for learners to show that they are able to integrate concepts, ideas and actions across Unit Standards to achieve competence that is grounded and coherent in relation to the purpose of the Qualification.

Integrated assessment should show how already demonstrated competence in individual areas can be linked and applied for the achievement of a holistic outcome as described in the exit level outcomes. Integrated assessment must judge the quality of the observable performance, and also the quality of the thinking that lies behind it. Assessment tools must encourage learners to give an account of the thinking and decision-making that underpin their demonstrated performance. Some assessment practices will demand practical evidence while others may be more theoretical, depending on the type of outcomes to be assessed. The ratio between action and interpretation is not fixed, but varies according to the demands of the particular exit level outcome of the gualification. While the generic components of this Qualification at NQF Level 5 can be assessed through occupational contexts and activities relating to Air Traffic Management, care must be taken in both the learning programme and the assessment to ensure that these foundational skills are portable. The primary aim of this Qualification is to ensure that learners have a sound base of introductory education and training to prepare them for further learning, whatever career path they may choose. Learners must be able to transfer generic skills across a number of different contexts, and apply them within a number of learning areas. A broad range of task-orientated and theoretical assessment tools may be used, with the distinction between practical knowledge and disciplinary knowledge maintained so that each. takes its rightful place.

#### INTERNATIONAL COMPARABILITY

Introduction

As with most other aviation related learning programmes the contents is governed by ICAO. During the international comparison no other qualifications as such were found, however, the existence of many learning programmes was evident. In many instances, the respective competencies are loose standing learning programmes presented as modules for easy integration into the respective aviation occupational training programmes. These could in a way serve the same purpose as Unit Standards developed for the NQF. The advantage of South African Qualifications and Unit Standards is that it provides for a holistic approach to the learner ensuring the development of the whole person as compared to just being able to perform a

Source: National Learners' Records Database

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specific task. The international comparison thus focuses on those countries and authorities that are governed by the same or similar international agreements. In this regard, the following countries were considered: Jordan, Finland, Zimbabwe and the People's Republic of China (PRC). Authorities considered were ICAO, IATA and Eurocontrol.

International comparability for the National Diploma: Aeronautical Information Management Practice is vested in the following:

• The standards espoused by the International Civil Aviation Organisation, of which South Africa is a signatory.

• A comparison with Jordan Civil Aviation Authority: Queen Noor Civil Aviation Technical College.

- A comparison with Finavia, Avia College, Helsinki-Vantaa Airport, Finland.
- A comparison with the International Air Transport Association (IATA).
- A comparison with Civil Aviation Department Hong Kong, People's Republic of China (PRC).
- A comparison with Eurocontrol: European Organisation for the Safety of Air Navigation.
- A comparison with Zimbabwe Civil Aviation Authority.

Collectively these bodies may be considered as major role players that comply with international standards for aviation. South Africa as part of the global community has to comply with at least these standards and recommended practices in order to ensure compliance and competitiveness. To this end, the AIM Qualification and associated Unit Standards include at least the requirements of the stated authorities, bodies and providers.

International Civil Aviation Organisation (ICAO):

The Convention on International Civil Aviation (also known as Chicago Convention), was signed on 7 December 1944 by 52 States. Pending ratification of the Convention by 26 States, the Provisional International Civil Aviation Organization (PICAO) was established. It functioned from 6 June 1945 until 4 April 1947. By 5 March 1947, the 26th ratification was received. ICAO came into being on 4 April 1947. In October of the same year, ICAO became a specialized agency of the United Nations linked to Economic and Social Council (ECOSOC).

The Air Navigation Bureau at ICAO headquarters provides technical expertise to the Assembly, Council and Air Navigation Commission in the following disciplines and respective sections:

• Aerodromes, air routes and ground aids; Accident investigation and prevention; Aeronautical information services and charts; Air traffic management; Communications, navigation and surveillance; Aviation medicine; Meteorology; Personnel licensing and training and Safety oversight.

This Bureau develops technical studies for the Air Navigation Commission as well as recommendations for Standards and Recommended Practises (SARPs) relating to safety, regulatory and efficiency of international air navigation for the Council.

The ICAO Air Traffic Management section is responsible for Global air traffic management operational concept; Strategic airspace management; Air traffic services (ATS); Air Traffic flow Management; Flight Operations; Functional Integration; Contingency Planning and Crisis Management and Search and Rescue.

Technical Publications relevant to this section and considered include:

• Annex 2: Rules of the Air; Annex 11: Air Traffic Services; Air Traffic Services Planning Manual (Doc 9426); Manual of Radiotelephony (Doc 9432); Manual concerning Interception of Civil Aircraft (Doc 9433); Manual Concerning Safety Measures Relating to Military Activities Potentially Hazardous to Civil Aircraft Operations (Doc 9554); Manual on Implementation of a

300 m (1 000 ft) Vertical Separation Minimum Between FL290 and FL 410 Inclusive (Doc 9574); Manual on Required Navigation Performance (RNP) (Doc 9613); Manual on Airspace Planning Methodology for the Determination of Separation Minima (Doc 9689); Manual of Air Traffic Services Data Link Applications (Doc 9694): International Aeronautical and Maritime Search and Rescue (MMSAR) Manual, Volume I: Organization and Management, Volume II: Mission Coordination and Volume III: Mobile Facilities (Doc 9731); Global Air Navigation Plans for CNS/ATM Systems (Doc 9750); Satellite-aided Search and Rescue: The COSPAS-SARSAT System (Circular 185); Simultaneous Operations on Parallel or Near parallel Instrument Runways (Circular 207) (new manual in preparation); Pilot Skills to make "Look-out" more effective in Visual Collision Avoidance (Circular 213) and Communications, Navigation and Surveillance (CNS) Section; Annex 10: Aeronautical Telecommunications; Volume I: Radio Navigation Aids Volume 11: Communication Procedures including those with PANS status Volume III: Communication Systems; Manual on Testing of Radio Navigation Aids (Doc 8071); Manual on the Planning and Engineering of the Aeronautical Fixed Telecommunication Network (Doc 8259); Manual of the Secondary Surveillance Radar (SSR) Systems (Doc 9684); Manual on Mode S Specific Services (Doc 9688); Manual of Technical Provisions for the Aeronautical Telecommunication Network (ATN) (Doc 9705); Manual on RNP for Approach, Landing and Departure Operations (in preparation); Manual on Technical Details for HF Data Link (in preparation); Manual on VHF Digital Link (VDL) Mode 2 (Doc 9776); Manual on VHF Digital Link (VDL) Mode 3 (in preparation); Manual on VHF Digital Link (VDL) Mode 4 (in preparation); Manual on ATS Ground-Ground Voice Switching and Signaling (in preparation); Guidelines for the Introduction and Operational Use of the Global Navigation Satellite System (GNSS) (Circular 267) and Study on the Refinement of the Satellite Broadcast Concept Circular.

Standards and recommended practices relevant to this section and considered include:

ICAO International Standards and Recommended Practices are adopted by the Council in accordance with Articles 54, 37 and 90 of the Convention on International Civil Aviation and are designated, for convenience, as Annexes to the Convention. The uniform application by Contracting States of the specifications contained in the International Standards is recognized as necessary for the safety or regularity of international air navigation while the uniform application of the specifications in the Recommended Practices is regarded as desirable in the interest of safety, regularity or efficiency of international air navigation.

Technical Manuals relevant to this section and considered include:

Technical Manuals provide guidance and information in amplification of the International Standards, Recommended Practices and PANS, the implementation of which they are designed to facilitate.

ICAO Standards relevant to this section and considered include:

The ICAO Standards were 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 relevant to this section and considered include:

 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 -

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Operations Manual - Annex 6; Operation of Aircraft - Extended Rang 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. ICAO Annex 4" Aeronautical Charts". This annex explains how airport characteristic charts are compiled and will help in the understanding of airport physical characteristics as published in the AIP and on ICAO types A, B and C chart where still available.

There has been an increasing trend for the traditional Aeronautical Information Services (AIS) to move towards one in which the information is not simply published as required by ICAO, but is managed and promoted in a wider sense. For example, many States are now preparing and delivering electronic products that better suit the needs of customers whilst helping to improve the integrity of data.

Jordan Civil Aviation Authority: Queen NOOR Civil Aviation Technical College:

Aeronautical Information Services training:

The aim of the 37 week training period is to train participant to carry out the functions and duties of aeronautical information service to ensure the flow of information necessary for the safety, regularity and efficiency of international air navigation. Training allows participants to carry out the functions and duties of aeronautical information service in providing Aeronautical Information Services according to ICAO Annexes 2, 11 and ICAO Manual 4444, ICAO Annex 15 and ICAO Manual 8126 to ensure the flow of information necessary for the safety, regularity and efficiency of international air navigation. Prerequisites are a General Secondary Certificate and good command of the English Language.

Training Content:

- Air Law and Aircraft Types.
- Aerodrome.
- Rules of the Air.
- Meteorology.
- Communication.
- Principles of Flight and Flight Instruments.
- Air Traffic Services.
- Navigation.
- Flight Plan.
- AIS General.
- Operations of Aircraft and Facilitation.
- NOTAM and Aeronautical Information Circulars.
- Aeronautical Information Publications (AIP).
- Pre-flight Information Service (Briefing).
- Aeronautical charts and cartography.
- Tele-typewriting.
- ICAO Annexes and Documents.

Source: National Learners' Records Database

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- Aeronautical Information Publications (AIP) and Supplement.
- Aeronautical charts and cartography.
- Flight Navigation and navigational aids.
- Air Traffic Services and Rules of the Air.
- Aeronautical telecommunication.
- Map Reading and charts.
- Location, Layout and coverage zone.
- Verbal and Self Briefing.
- Briefing Bulletins (computerized and manual).
- Post flight Information Services.
- Navigational charts.
- Operation of Aircraft and facilitation.
- ATS messages.
- Euro Control CFMU System.
- Specimen-AIP and explanatory notes.
- Compiling and editing.
- Presentation of information.
- Specifications for index maps and diagrams.
- AIP charts.
- Notification of differences in the AIP.
- AIP amendments.
- AIP supplements.
- AIRAC system for AIP amendments and supplements.
- Distribution.
- Purposes and types of flight plans.
- Format of flight plan. -
- Submission of flight plan.
- Acceptance of flight plan.
- Changes to flight plan.
- Closing and adherence to flight plan.
- Fuel and oil supply.
- Wake turbulence categorization of ACFT.
- Instructions for completion of flight plan.
- Flight plan messages and addressing.
- Delay, modification, cancellation, departure and arrival messages.
- Transmission of flight plan messages.
- Co-ordination, current, supplementary and estimate messages.
- Repetitive flight plan RPL.

Finavia, Avia College, Helsinki-Vantaa Airport, Finland:

Aeronautical Information Services Officer Training:

Entry Requirements & Training:

The duration of the training for an AIS Officer is approximately one year and is undertaken by an apprenticeship agreement. The training period is divided into theoretical and practical sections.

The main features of the theoretical sections are the same as for air traffic controller and flight information officer theory training. The theory also includes training in Aeronautical Information Services procedures. The main part of the practical training takes place at the International NOTAM office.

Familiarity with computer work and experience in aviation or air navigation services is regarded as an advantage.

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International Air Transport Association (IATA):

Management of Aeronautical Information Services (AIS) Training:

This course allows participants to understand how to make aeronautical information of the required quality available in real-time and in the common format to any airspace user, any time, anywhere.

Participants learn implementation strategies for a uniform and efficient aeronautical information management structure within the framework of system-wide management of information, to support all phases of flight.

## Course Content:

- Aeronautical Information Publications (AIPs), amendments and supplements.
- Aeronautical Information Circulars (AICs).
- Notices to Airmen (NOTAMs).
- New concepts in data scope, quality, content, integration, presentation, delivery and in-flight data provision.
- Definition of supporting components including information exchange models.
- Technology in enabling areas such as communication and graphics.
- Use of AIS in the cockpit.
- Implementation strategies.
- Collaborative Decision Making.

Civil Aviation Department Hong Kong, People's Republic of China (PRC):

AIS Training is presented to provide participants with fundamental knowledge on aviation and provision of Aeronautical Information Services.

Course content:

- International Civil Aviation Organization (ICAO).
- Aerodrome markings and lights.
- Communications.
- Radio aids to civil aviation.
- Map projection.
- Elementary navigation.
- Aeronautical Information Services:
- The Aeronautical Information Publication (AIP).
- Aeronautical Information Circulars (AIC).
- System NOTAM.
- AIP Supplements.
- Dissemination of information.
- Briefing and pre-flight information bulletins.
- Acceptance of flight plans.
- Visits to airfield.
- Visits to dispatch offices of airlines.
- Attachment to Aeronautical Information Centre.

EUROCONTROL: European Organisation for the Safety of Air Navigation:

Common Core Content and Training Objectives for Basic AIS Training:

The European Air Traffic Control Harmonisation and Integration Programme (EATCHIP), through the Human Resources Team (HRT) and its Training Sub-Group (TSG), established an Aeronautical Information Services Training Task Force (AIS-TF) to design a set of common core contents, including training objectives and syllabi for the training of Aeronautical Information Services (AIS) Personnel from entry to full operational status.

Basic AIS training has been divided into two phases. Phase 1 provides for a common knowledge of Air Traffic Services (ATS) for all entrants to the AIS regardless of their final destination.

Course Content:

EATCHIP guidelines for 'Common Core Content and Training Objectives for Basic AIS Training (Phase 1 Ab Initio) includes four subjects (Air Law, NOTAM Office (NOF), ATS Reporting Office (ARO) and Publications and Charts).

This phase is a prerequisite for Phase 2, which provides more understanding and the opportunity to practise skills needed within the functions and tasks carried out by the NOTAM Office (NOF), Publications and Charts (PUB) and the ATS Reporting Office (ARO). Phase 2 course content includes:

• Documentation (The general objectives for ICAO Documentation are to ensure that students have a detailed knowledge of the documents that are regularly and to be able to decode and encode abbreviations and codes used in AIS).

• Aerodromes (The general objectives for Aerodromes are to explain the significance of aerodrome data and to describe the physical characteristics of the manoeuvring area and apron areas).

• NOTAM Office (NOF) (The general objectives for the NOTAM Office are to describe and explain the purpose, function and significance of NOTAM; to prepare, distribute and store outgoing NOTAM; and to receive and process incoming NOTAM).

• Air Traffic Service Reporting Office (ARO) (The general objectives for ARO are to accept, verify and transmit flight plans and associated messages and to conduct an appropriate and complete briefing).

• Publications and Charts (PUB) (The general objectives for Publications and Charts are to collect and prepare aeronautical information for publication in the appropriate format and to prepare and publish aeronautical charts).

• Human Performance (The general objective for Human Performance is to identify the importance of social skills and teamwork in the AIS environment).

• The Work Environment (The general objectives for The Work Environment are to apply appropriate local and emergency procedures in the work place and to operate equipment efficiently).

• ATM Developments (The general objective for ATM Developments is to be aware of ongoing developments in ATM and their possible impact on AIS).

• Co-operating Services (The general objective for Co-operating Services is to appreciate the need for close co-operation with other agencies concerning AIS operations).

Zimbabwe Civil Aviation Authority:

Training Manual-Adopted by CAA Zimbabwe for AIS Officers:

Phase I: Common core knowledge:

A. Aviation specific knowledge requirements E3-1:

- Civil air law, rules and regulations.
- Aviation Terminology, Flight Operation and Aircraft Components E3-4.

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- Navigation E3-7.
- Aircraft mass (weight), balance control and performance E3-15.
- Air traffic management (ATM) and Search and Rescue E3-17.
- Aerodromes and Heliports E3-23.
- Aeronautical Communication and Navigation Facilities, Services and Procedures E3-27.
- Aeronautical meteorology E3-33.
- Designated authorities and requirements for international flights E3-50.
- The safe transport of dangerous goods by air E3-50.
- Security (emergencies and abnormal situations) E3-52.
- B. AIS/MAP specific knowledge requirements:
- Aeronautical Information Services E3-1.
- Aeronautical Charts E3-6.
- World Geodetic System-1984 (WGS-84) E3-11.
- ICAO Abbreviations and Codes E3-13.
- Location Indicators E3-14.
- Regional Supplementary Procedures (SUPPS) E3-15.
- Quality System E3-16.
- Aeronautical Information Services provided by States E3-19.
- Aeronautical Chart Catalogue E3-20.
- Flight Plans E3-21.
- Human Factors (Overview) E3-22.
- Units of measurement to be used in air and ground operations E3-29.
- Aircraft Type designators E3-30.
- Designators for Aircraft Operating Agencies, E3-30.
- Aeronautical Authorities and Services.
- Aeronautical English (written) E3-31.

Phase II: Specialization:

- AIS/MAP specialization E3-1.
- AIS/MAP Aerodrome unit/ARO specialist.
- INTERNATIONAL NOTAM Office (NOF) specialist.
- AIS/MAP Data base specialist.
- AIS/MAP documentation/editing/text producing specialist.
- Aeronautical cartography specialist.

Conclusion:

Compliance with ICAO standard as a base line was found. As far as the core of the qualifications is concerned it was found that the contents were very much the same. The contents of this National Certificate: AIM compares favourably with the qualifications provided by Jordan, Zimbabwe, Finland and People's Republic of China. This Qualification compares well with vocational training presented by IATA and EUROCONTROL.

Of specific importance is to note that this Qualification and Unit Standards provide for a holistic approach to the learner ensuring the development of the whole person as compared to being confined to a specific and narrowly defined task.

# ARTICULATION OPTIONS

This Qualification has been developed as an entry-level qualification into Air Traffic Management and is intended to provide a career in its own right, as well as to facilitate progression to other air traffic qualifications. Learners can move horizontally or vertically between aviation related qualifications, although in most cases, some standards will be required horizontally before moving to another qualification vertically.

This Qualification has horizontal articulation with the following qualifications:

- ID 58581: National Certificate: Air Traffic Support, NQF Level 5.
- ID 49853: National Diploma: Defensive Mission Control, NQF Level 5.
- ID 58580: National Certificate: Aerodrome Control, NQF Level 5.

• ID 57229: National Certificate: Communications, Navigation and Surveillance Support, NQF Level 5.

- ID 58784: National Diploma: Geospatial Image Analysis, NQF Level 5.
- ID 59950: 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 58579: National Diploma: Air Traffic Control, NQF Level 6.
- National Diploma: Flight Dispatch, NQF Level 6.
- ID 58008: National Diploma: Aircraft Piloting, NQF Level 6.

Learning Pathway:

- ID 58579: National Diploma: Air Traffic Control, NQF Level 6.
- ID 60549: National Diploma: Aeronautical Information Management Practice, NQF Level 5.

#### **MODERATION OPTIONS**

• Moderation of learner achievements takes place at providers accredited by the applicable ETQA".

• 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 subject matter expertise within AIM.

• Competent in the Exit Level Outcomes of the National Diploma: Aeronautical Information Management.

• To be a registered assessor with the relevant Education and Training Quality Assurance Body.

• Detailed documentary proof of educational qualification, practical training undergone, and experience gained by the applicant must be provided (Portfolio of evidence). Assessment competencies and subject matter experience of the assessor can be established by recognition of prior learning.

#### NOTES

The elective unit standard category is open ended to allow the learner to choose the 62 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.

Source: National Learners' Records Database Qualification 60549 07/02/2008 Page 13

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.

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.

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

• 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.

Definitions:

Aeronautical Data:

A representation of aeronautical facts, concepts or instructions in a formalized manner suitable for communication, interpretation or processing.

Aeronautical Information:

Information resulting from the assembly, analysis and formatting of aeronautical data.

Assemble:

A process of merging data from multiple sources into a database and establishing a baseline for subsequent processing.

Note: The phase includes checking the data and ensuring that detected errors and omissions are rectified.

Aeronautical Information Service (AIS):

Traditionally the Aeronautical Information Service (AIS) is an inflexible, slow to amend product centric and often paper based service providing aeronautical information via a "push" system. This service is mainly pre-flight orientated.

Aeronautical Information Management (AIM):

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Aeronautical Information Management (AIM) is the term applied to the globally interoperable provision of aeronautical data of the required quality, covering the needs of the present and future ATM system and all phases of flight, in a data orientated, holistic approach. AIM is a data centric and system orientated solution, one in which timely and quality assured data is made available permanently and dynamically for use in applications that perform the required tasks, be it flight planning, flight management, navigation, separation assurance, collaborative decision making (CDM) or any other strategic or tactical activity. The principles of System Wide Information Management (SWIM) form the basis of AIM.

Terms, Definitions and Abbreviations:

• 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.

• Aerodrome Elevation: The elevation of the highest point of the landing area.

• Aerodrome reference Point: The designated Geographical location of the aerodrome.

• Aeronautical Information Management (AIM): Aeronautical Information Management (AIM) is the globally interoperable provision of aeronautical data of the required quality, covering the needs of the ATM community, present and future ATM systems throughout all phases of flight, in a data orientated, holistic approach. AIM is a data centric and system orientated solution, one in which the right digital aeronautical information is provided at the right place and at the right time. Quality assured data is made available permanently and dynamically for use in applications that perform the required tasks, be it flight planning, flight management, navigation, separation assurance, collaborative decision making (CDM) or any other strategic or tactical activity. The principles of System Wide Information Management (SWIM) form the basis of AIM.

• Aeronautical Information Services (AIS): A service established within the defined area of coverage responsible for the provision of aeronautical information/data necessary for the safety, regularity and efficiency of air navigation.

• Aerodrome Traffic Zone: An airspace of defined dimensions established around an aerodrome, for the protection of aerodrome traffic.

• Aeronautical Fixed Service: A telecommunication service between specified Points (AFS) provided primarily for the safety of air navigation and for the regular, Efficient and economical operation of air services.

• Aeronautical Fixed circuit: A circuit forming part of the aeronautical fixed service.

• Aeronautical Information: A publication issued by or Publication with the authority of a State and containing aeronautical information of a lasting character essential to air navigation.

• Aeronautical Information Circular (AIC): A notice containing information that does not Qualify for the origination of a NOTAM or for inclusion in the AIP, but which relates to flight safety, air navigation, technical, Administrative or legislative matters.

• Aeronautical Telecommunication Network (ATN): An internet work architected that allows ground, air ground and avionics sub data networks to interpolate by adopting common interface services and protocols based on the international organisation for standardisation (ISO) Open Systems Interconnection (OSI) reference module.

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• Aeronautical Telecommunication Service: A telecommunication service provided for any Aeronautical purpose.

• Aeronautical Fixed Telecommunication Network (AFTN): A worldwide system of aeronautical fixed circuits provided, as part of the aeronautical fixed service, for the exchange of messages and or digital data between aeronautical fixed stations having the same or Compatible communication characteristics.

• Aeronautical Information Regulation and Control (AIRAC): An acronym (aeronautical information regulation and control) Signifying a system aimed at advance notification based on Common effective dates, of circumstances that necessitate Significant changes in operating practices.

• 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.

• Aeronautical information publication amendment: Permanent changes to the information contained in the AIP.

• Aeronautical Information Publication Supplement (AIP Supp): Temporary changes to the information contained in the AIP, which are Published by means of special pages.

• Altitude: The vertical distance of a level, a point or an object considered as a point, measured from mean sea level.

• 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:

• A) Preventing collisions:

• I) Between aircraft.

• Ii) On the manoeuvring area between aircraft and obstructions.

• B) 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.

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• Air traffic services airspaces: Airspaces of defend dimensions, alphabetically designed, within which specific types of flights any 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 (Alphanumeric) 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 the enables the identification of aircraft.

• Automatic terminal information services (ATIS): The provision of current, routine information to arriving and departing and departing aircraft by means of continuous and repetitive broadcasts throughout the day or a specified portion thereof.

• Current flight plan: The flight plan, including changes, if any, brought about by subsequent clearances.

• Control area: A controller 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 defend diminutions 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.

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

• Danger area: An airspace of defined dimensions within which activities Dangerous to the flight of aircraft may exist at specified times.

• Decision altitude/ height: A specified altitude or height in the precision approach at Which a missed approach must be initiated if the required visual Reference to continue the approach has not been established.

• Detresfa: The code word used to designate a distress phase.

• 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.

Emergency phases:

• Emergency phase: A generic term meaning, as the case may be, uncertainty phase, alert phase or distress phase.

• Incerfa (uncertainty phase): A situation wherein uncertainty exists as to the safety of an aircraft and its occupants.

• Alerfa (alert phase): A situation wherein apprehension exists as to the Safety of an aircraft and its occupants.

• Detresfa (distress phase): A situation wherein there is reasonable certainty that An aircraft and its occupants are threatened by a grave and Imminent danger or require immediate assistance.

• Estimated elapsed time: The estimated time required to proceed from one significant point to another.

• 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.

• Flight information region: An airspace of defined dimensions within which Flight information service and alerting service is provided.

• 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 abound 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.

• Glide path: A descent profile defined for vertical guidance during a final Approach.

• 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

• Height: The vertical distance of a level, a point of 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.

• Heliport: An aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface Movement of helicopters.

Holding point: A) A specified location, identified by visual or other means, In the vicinity of which the position of an aircraft in flight Is maintained in accordance with air traffic control clearances.
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 enroute obstacle criteria apply.

• Instrument meteorological conditions (IMC): Meteorological conditions expressed in terms of visibility, distance from could 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.

• Information Management (IM): The ultimate goal of AIM is to evolve into generic Information Management (IM) which requires the full implementation of System Wide Information Management (SWIM). The system will seamlessly capture and distribute Global data, by managing the content (format, timeliness, collection, checking, distribution etc) as well as the technical elements (storage, consistency of data bases, global interfacing, etc). Information management will fully include AIM while encompassing all relevant information (not already incorporated in AIM) in support of a cost effective and efficient ATM system.

• Integrated aeronautical information package (IAIP): A package which consists of the following elements:

• AIP, including amendment service.

• Supplements to the AIP.

• NOTAM and pre-flight information bulletins (PIB).

∘ AIC.

NOTAM checklists and summaries.

• Level: A generic term relating to the vertical position of an aircraft in flight and meaning variously height, altitude or flight level.

• Location indicator: A four letter code group formulated in accordance with rules prescribed by ICAO and assigned to the location of an aeronautical fixed station.

• 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.

• Movement area: That part of the aerodrome to be used for the take-off, Landing and taxiing of aircraft, consisting of the Manoeuvring area and the apron(s).

• 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.

• Operator: A person, organisation or enterprise engaged in or offering to Engage in an aircraft operation.

• 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.

• Pre-flight information bulletin (PIB): A presentation of current NOTAM information of Significance, prepared prior to flight.

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• Prohibited area: An airspace of defined dimensions, above the land Areas or territorial waters of a state, within which the Flight of aircraft is prohibited.

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 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 n 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 takeoff 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 runways surface marking or the lights delineating the runway or identify it's centre line.

• Radial: A magnetic bearing extending from a VOR/VORTAC/TACAN.

• Repetitive flight plan (RPL): A flight plan related to a series of frequently recurring, regularly Operated individual flights with identical basic features, Submitted by an operator for retention and repetitive use by ATS units.

• 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.

• Restricted area: An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of Aircraft is restricted in accordance with certain Specified conditions.

• 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.

• Taxing: 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:

 A) Aircraft stand taxi lane: A portion of an apron designated as a taxiway and intended to provide access to aircraft stands only.

• B) Apron taxiway: A portion of a taxiway system location an apron and intended to provide a through taxi route across the apron.

 C) 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 issue 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.

• Telecommunications: Any transmission, emission or reception of signs, signals, Writing, images and sounds or intelligences of any nature by Wire, radio, visual or other electromagnetic systems.

 Terminal control area: A control area normally established at the confluence of ATS Routes in the vicinity of one or more major aerodromes.

• Threshold: The beginning of that portion of the runway useable for landing.

 Total estimated elapsed time: For IFR flights, the estimated time required from take-off to Arrival 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 destination aerodrome, to arrive over the Destination aerodrome. For VFR flights, the estimated time Required from take-off to arrive over the destination aerodrome.

 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.

• Transponder: A receiver/transmitter which will generate a reply signal upon proper interrogation (the interrogation and reply being on different frequencies).

Transition level: The lowest flight level available for use above the Transition Altitude.

Transition layer: The airspace between Transition Altitude and Transition Level.

 Transition altitude: The altitude at or below which the vertical position of an aircraft is controlled by reference to altitudes.

Visibility: Visibility for aeronautical purposes is the greater of:

 A) 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.

• B) 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.

VFR Flight: A flight conducted in accordance with the visual flight rules.

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:

• A) Fly-by waypoint: A way point which requires turn anticipation to allow tangential interception of the next segment from a route or procedure.

• B) Flyover way point: A way point which a turn is initiated in order to joint 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.
- ADSB: 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.
- AFI: African-Indian Ocean Region.
- AAD: Assigned Altitude Deviation.
- AOC: Aircraft Operating Certificate.
- ASE: Altimetry System Error.
- ATC: Air Traffic Control.
- ATCU: Air Traffic Control Unit.
- ATD: Actual Time of Departure.
- 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.
- AGL: Above Ground Level.
- AIS: Aeronautical Information Service.
- AIP: Aeronautical Information Publication.
- AIM: Aeronautical Information Management.
- APP: Approach Control Centre.
- ARR: Arrival.

- AIC: Aeronautical Information Circular.
- CAA: Civil Aviation Authority.
- CAR: Civil Aviation Regulations.
- CATS: Civil Aviation Technical Standards.
- c/s: Callsign.
- CPDLC: Controller-Pilot Data Link Communications.
- CTA: Control Area.
- CVOR: Conventional very High Frequency Omni-directional Range.
- CNS: Communication Navigation and Surveillance.
- CTR: Control Zone.
- CRM: Collision Risk Model.
- C/L: Center Line.
- DEP: Depart, Departure or Departed.
- DLA: Delay or Delayed.
- D/F: Direction Finding.
- DME: Distance Measuring Equipment.
- DVOR: Doppler very High Frequency Omni-directional Range.
- DOT: Department of Transport.
- DAIW: Danger Area Infringement Warning.
- DR: Dead Reckoning.
- DA/H: Decision Altitude/Height.
- EAT: Expected Approach Time.
- ETA: Expected Time of Arrival.
- ETD: Expected Time of Departure.
- EICAS: Engine indication and Crew Alerting System.
- FANS: Future Air Navigation System.
- FIM: Flight Information Manual.
- FIR: Flight Information Region.
- FMC: Flight Management Computer.
- FLAS: Flight Level Allocation System.
- FL: Flight Level.
- 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.
- GAT: General Air Traffic.
- GP: Glide Path.
- HMU: Height monitoring Unit.
- HPa: Hectopascals.
- HF: High Frequency.
- 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.
- LAT: Latitude.
- LONG: Longitude.

Source: National Learners' Records Database

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- LVP: Low Visibility Procedures.
- 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.
- MM: Middle Marker.
- MDA/H: Minimum Descent Altitude/Height.
- MSA: Minimum Sector Altitude.
- MSL: Mean Sea Level.
- ND: Navigation Display.
- NOTAM: Notices to Airmen.
- NDB: Non-Directional Radio Beacon.
- NAT: North Atlantic Region.
- NM: Nautical Mile.
- OCA/H: Obstacle Clearance Altitude/ Height.
- OCT: Onward Clearance Time.
- OAT: Operational Air traffic.
- OM: Outer Marker.
- OHD: Overhead.
- PAPI: Precision Approach Path Indicator.
- PPI: Plan Position Indicator.
- PSR: Primary Surveillance Radar
- 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.
- RPL: Repetitive Flight Plans.
- RMA: Regional Monitoring Agency.
- RNP: Required Navigation Performance.
- RNAV: Area Navigation.
- RVSM: Reduced Vertical Separation Minima.
- RVR: Runway Visual Range.
- RTF: Radiotelephony.
- 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.
- TVE: Total Vertical Error.
- TCAS: Traffic Collision Avoidance System.
- UTC: Universal Time Constant (Co-ordinated Universal Time Constant).
- •UHF: Ultra High Frequency.
- •U/S: Unserviceable.
- 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.
- VASIS: Visual Approach Slope Indicator System.
- •WAC: World Aeronautical Charts.
- •WGS: World Geodetic System.
- •WIP: Work In Progress.
- •WX: Weather.
- •WDI: Wind Direction Indicator.

# UNIT STANDARDS

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Fundamental	242706	Analyse problems	Level 5	4
Fundamental	15234	Apply efficient time management to the work of a	Level 5	4
		department/division/section		
Fundamental	244207	Apply elementary principles of aircraft navigation theory	Level 5	6
Fundamental	10622	Conduct communication within a business environment	Level 5	8
Fundamental	230203	Demonstrate an understanding of air traffic management	Level 5	4
		operations		
Fundamental	244209	Demonstrate team resource management within a specific	Level 5	10
		work environment		
Fundamental	244206	Describe elementary aerodynamic principles of flight	Level 5	5
Fundamental	115823	Gather and manage information for decision-making	Level 5	5
Fundamental	120042	Interpret meteorology for aviation	Level 5	7
Fundamental	12433	Use communication techniques effectively	Level 5	8
Fundamental	230078	Apply the principles of ethics to a business environment	Level 6	10
Core	115468	Interpret a topographical map for navigational purposes	Level 4	2
Core	120304	Analyse, interpret and communicate information	Level 5	9
Core	243325	Apply safety principles for flight operations	Level 5	5
Core	117539	Assess the quality of written text	Level 5	
Core	246519	Assure own publishing project output quality	Level 5	5
Core	119797	Conduct audits within a quality management system	Level 5	8
Core	114049	Demonstrate an understanding of Computer Database	Level 5	7
		Management Systems		
Core	244201	Demonstrate an understanding of the inter-relationship	Level 5	20
		between aircraft flight systems, aerodrome facilities and		
		aeronautical navigation facilities		
Core	116778	Develop quality plans and ensure overall quality of	Level 5	10
		products or services in a small business or business unit		
Core	244202	Explain aviation legislation related to air traffic services	Level 5	5
Core	244203	Interpret and communicate aeronautical information in	Level 5	16
		support of air traffic management		

Source: National Learners' Records Database

Qualification 60549

07/02/2008

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Core	117439	Disseminate information	Level 6	15
Elective	11726	Compute geodetic information using basic principles and understanding of geodetic surveying	Level 4	2
Elective	14942	Demonstrate an understanding of computer network communication	Level 4	9
Elective	120372	Explain fundamentals of project management	Level 4	5
Elective	115053	Administer local area computer networks	Level 5	9
Elective	120310	Apply client service techniques to improve service delivery	Level 5	6
Elective	120303	Apply principles of risk management	Level 5	8
Elective	7923	Carry out surveillance investigations and audits	Level 5	10
Elective	246530	Collect information for publishing processes	Level 5	5
Elective	117575	Configure and administer a database	Level 5	6
Elective	246527	Coordinate publishing document and information flow	Level 5	7
Elective	115855	Create, maintain and update record keeping systems	Level 5	5
Elective	114061	Demonstrate an understanding of Wide Area Computer Networks (WAN`s), comparing them with Local Area Networks (LAN`s)	Level 5	5
Elective	230208	Demonstrate an understanding of the principles of air traffic management communications systems	Level 5	6
Elective	116874	Demonstrate basic understanding of GIS vector data structures for data acquisition	Level 5	3
Elective	120044	Demonstrate knowledge of Airpower	Level 5	5
Elective	120156	Demonstrate understanding of South African Aviation law,	Level 5	10
		procedures for small commercial aeroplane operations		
Elective	120045	Demonstrate understanding of aircraft instrumentation	Level 5	6
Elective	120040	Demonstrate understanding of the concepts of operational command and control	Level 5	2
Elective	14272	Design and produce cartographic products using fundamental cartographic principles	Level 5	5
Elective	243816	Develop a project quality management plan for a simple to moderately complex project	Level 5	6
Elective	119173	Develop and maintain effective working relationship with clients	Level 5	8
Elective	116823	Disseminate spatial data	Level 5	2
Elective	243269	Measure customer satisfaction within a business unit and recommend corrective action	Level 5	14
Elective	230206	Monitor and operate communication control and switching systems	Level 5	6
Elective	230201	Monitor and operate communication reception systems	Level 5	9
Elective	230204	Monitor and operate communication transmission systems	Level 5	9
Elective	246663	Perform surveillance on Information and Communications technology networks	Level 5	10
Elective	120378	Support the project environment and activities to deliver project objectives	Level 5	14
Elective	115791	Use language and communication strategies for vocational and occupational learning	Level 5	5
Elective	251963	Utilise communication and information management systems	Level 5	10
Elective	243278	Analyse and apply safety principles in aviation	Level 6	5
Elective	11823	Capture spatial data for Geographical Information System (GIS) using a single-phase Global Navigation Satellite System (GNSS)	Level 6	6
Elective	11828	Compile a survey record and accompanying documentation for submission to the Surveyor-General	Level 6	5
Elective	120148	Design Visual and Instrument Flight Procedures	Level 6	18
Elective	120306	Manage service delivery improvement	Level 6	8

# LEARNING PROGRAMMES RECORDED AGAINST THIS QUALIFICATION None