Civil Aviation Safety Authority
of Papua New Guinea

Advisory Circular

AC65-3

Air Traffic Service Personnel Licences and Ratings – Air Traffic Controller Licences

Issue 3

22 June 2023

GENERAL

Civil Aviation Safety Authority Advisory Circulars (AC) contain information about standards, practices and procedures that the Director has found to be an Acceptable Means of Compliance (AMC) with the associated rule.

An AMC is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices or procedures are found to be acceptable, they will be added to the appropriate Advisory Circular.

This Advisory Circular also includes Explanatory Material (EM) where it has been shown that further explanation is required. Explanatory Material must not be regarded as an acceptable means of compliance.

PURPOSE

This Advisory Circular provides methods, acceptable to the Director, for showing compliance with the air traffic controller licences ratings and requirements of Rule Part 65 and explanatory material to assist in showing compliance.

RELATED CAR

This AC relates specifically to Civil Aviation Rule Parts 65 Subpart B.

CHANGE NOTICE

This AC replaces Issue 2 dated 01 December 2022.

APPROVAL

This AC has been approved for publication by the Director of Civil Aviation.

TABLE OF CONTENTS

Introduction

Civil Aviation Rule Part 65 *Air Traffic Service Personnel Licences and Ratings* was issued on 1 January 2004. This part prescribes rules governing the issue of air traffic service licences and ratings, the conditions under which those licences and ratings are necessary, and the privileges and limitations of those licences and ratings.

This advisory circular forms part of a series of advisory circulars that supports these rules – one for each required rating.

Advisory Circular Intent and Process

This advisory circular provides guidance on how to comply with Civil Aviation Rule Part 65 Subpart B - *Air Traffic Controller Licence*.

The Civil Aviation Safety Authority (CASA) is actively managing the development of syllabuses into specific objective format. This format specifies exactly what has to be covered, and to what standard, so that no matter who studies, who instructs, and who assesses, all are working to exactly the same standards

Subpart B – Air Traffic Controller Licences

Rule 65.101 Purpose

Subpart B prescribes the rules governing the issue of air traffic controller licences and the privileges and limitations of those licences.

Rule 65.103 Eligibility requirements

Rule 65.103(a) (4) requires an applicant for an air traffic controller licence to have passed examinations relevant to the duties of an air traffic controller, in air law, rules and regulations, air traffic control equipment, general aircraft knowledge, human factors, meteorology, navigation, and operational procedures.

Successful assessment based on the syllabus given in Appendix A of this advisory circular would meet the requirements of Rule 65.103(5).

Subpart C – Air Traffic Controller Ratings

Rule 65.203 Eligibility requirements

Rule 65.203 (2) requires the applicant to have satisfactorily completed a training course relevant to the subject areas stated in (2) (i-iv). These training courses shall be approved by the Director whether under Part 141, Part 172 or an overseas training organization duly recognized by ICAO.

Appendix A – Subject No.100 – Air Traffic Controller Licence

Syllabus

Each subject has been given a subject number and each topic within that subject a topic number. These reference numbers may be used on 'knowledge deficiency reports' and will provide valuable feedback to the examination candidate.

Sub Topic	Syllabus Item
General	
100.2	***Rules and Regulations***
100.2.2	Describe the purpose and function of International Civil Aviation Organization (ICAO).
100.2.4	Describe the relationship between Papua New Guinea and ICAO.
100.2.6	Describe the main principle established by the 'five freedoms of their'.
100.2.8	Describe the methods by which ICAO notifies and implements legislation.

100.2.10 Describe the relationships between PANS and ICAO Standards and Recommended Practices (SARPS).

100.2.12 Describe in general terms the content of the ICAO annexes.

100.2.14 Identify the origin of the objectives of air traffic services.

100.2.16 Explain the considerations which determine the need for air traffic services.

100.2.18 Describe the purpose and function of the Papua New Guinea CASA.

100.2.20 Describe in general terms the Civil Aviation Act that is the basis of regulatory legislation for the civil aviation system in Papua New Guinea.

100.2.22 Describe the function and types of rules provided for under the Civil Aviation Act, including their relationship to the provision of air traffic services.

100.2.24 Describe in general terms the requirements for notifying differences with ICAO.

100.4 ATS Documents

100.4.2 List the core ATS operations manual and supporting documents that comply with the requirements of Part 172.

100.4.4 Describe in general terms the content of the core ATS operations manual.

100.4.6 Explain in general terms the processes associated with the use of the ATS operations manual and supporting documents.

100.4.8 Describe the purpose and overall content of local unit orders.

100.4.10 Describe the purpose of letters of agreement and memorandum of understanding.

100.4.12 State where you would locate definitions for ATS terms.

100.4.14 State where you would locate the word and phrase abbreviations and acronyms most commonly used.

100.4.16 State where you would find the location indicators.

100.4.18 Describe the request for change process for changes to ATS operations manuals.

100.4.20 Explain in general terms the document control process.

100.4.22 Describe the correct use of the following words contained in operational ATS manuals:

(a) shall

(b) should

(c) may

(d) need not

(e) will.

100.6 ATC Licence Privileges and Conditions

100.6.2 Describe the conditions which must be met for the issue and maintenance of an ATC licence.

100.6.4 State the requirements for holding a medical certificate.

100.6.6 Explain in general terms the PNG CASA system of assessing medical fitness.

100.6.8 Describe the responsibilities of a licence holder with respect to changes in their medical condition, as laid down in Civil Aviation Act 2000 Section 64.

100.6.10 Describe the responsibilities of a licence holder with respect to safety offences.

100.6.12 State the general requirements for entering details into the ATS logbook.

100.6.14 Describe the recent experience requirements including:

(a) current operating practice (COP)

(b) regaining COP

(c) cyclical training

(d) location of this information.

100.8 Flight Rules

100.8.2 Define IFR and VFR and ICAO requirements.

100.8.4 Describe the terms VMC and IMC.

100.8.6 State the VFR meteorological minima for visibility and distance from cloud for the following:

(a) airspace at and above 10,000ft;

(b) airspace below 10,000ft and above 3,000ft (or 1,000ft above terrain whichever is higher)

(c) ~~G~~ airspace at or below 3,000ft (or 1,000ft above terrain whichever is higher)

(d) helicopters.

100.8.8 State the aerodrome meteorological minima.

100.8.10 State the minimum safe heights for VFR flights.

100.8.12 State the VFR table of cruising levels.

100.8.14 Define Special VFR.

100.8.16 Identify the circumstances under which a flight is required to operate Special VFR.

100.8.18 Describe the fuel reserve requirements for VFR flights by day and night.

100.8.20 State the right of way rules for aircraft in flight.

100.8.22 Describe the position reporting requirements for VFR flights under Part 91.

100.8.24 Describe the IFR adherence to flight plan requirements under Part 91.

100.8.26 Describe the difference between VFR and IFR with reference to operations in VMC and IMC.

100.8.28 Describe the flight rules, regulations and minima for VFR operations in Papua New Guinea.

100.8.30 Describe the VFR meteorological minima for visibility and distance from cloud, including for helicopters.

100.8.32 Describe the aerodrome meteorological minima.

100.8.34 Identify the circumstances under which a flight is required to operate special VFR.

100.8.36 Identify the minimum clearance heights for VFR, including exceptions.

100.8.38 Describe the right of way rules for aircraft in flight.

100.8.40 Explain the functions of a flight plan.

100.8.42 Describe the general design and layout of an aerodrome.

100.8.44 Explain the numbering system and orientation of runways.

100.8.46 Describe designated positions in the traffic circuit.

100.8.48 State the requirements for an aircraft reporting its position.

100.10 Aeronautical Information Service

100.10.2 Describe the function and purpose of the Aeronautical Information Service (AIS).

100.10.4 Identify the components of the aeronautical information system, including the meanings of the acronyms.

100.10.6 Describe the publications and processes associated with the AIP.

100.10.8 Describe the purpose of aeronautical information circulars.

100.10.10 Describe the processes associated with NOTAM issue, including:

(a) NOTAM origination criteria

(b) NOTAM distribution

(c) NOTAM preparation and composition

(d) International NOTAM office

(e) NAVAID status NOTAMS

(f) NOTAM request

(g) NOTAM register

(h) NOTAM cancellation

(i) action of unit on receipt of NOTAM

(j) NOTAM area chart.

100.10.12 Explain the requirements for a pre-flight information service, including where it is to be obtained.

Meteorology

100.12 Fundamentals of the Atmosphere

100.12.2 Identify the elements of the earth's atmosphere.

100.12.4 Explain the basic physical structure of the atmosphere, including vertical structure as it relates to aviation.

100.12.6 Identify the divisions of the atmosphere that are of greatest relevance to aviation.

100.12.8 Explain the relationships between volume, temperature, pressure and density, and their importance to aircraft operations.

100.12.10 Explain in general terms what is meant by temperature lapse rate, and its relationship to the tropopause.

100.12.12 Explain the impact of humidity on density and its relevance to aircraft performance.

100.12.14 Define the values of the ICAO standard atmosphere.

100.12.16 Explain how to calculate pressure and density altitude.

100.12.18 Explain the methods and properties of heat transfer in the atmosphere and how it relates to global and regional weather patterns.

100.12.20 Explain various heat transfer methods including radiation, conduction and convection.

100.12.22 Explain the different types of temperature variations.

100.12.24 Explain the properties of water vapour in the atmosphere, including origins of moisture in the atmosphere.

100.12.26 Describe the processes of condensation and sublimation.

100.12.28 Define the term saturation.

100.12.30 Describe the process of latent heat of vaporization.

100.12.32 Explain ‘dew point’.

100.12.34 Define the term ‘relative humidity’.

100.12.36 Explain the general principles of atmospheric stability.

100.12.38 Define the ICAO standard adiabatic lapse rate.

100.12.40 Explain the trigger mechanisms of forced air ascent.

100.12.42 Explain the atmospheric lapse rate and their values.

100.12.44 Explain general atmospheric conditions in stable and unstable air when flying.

100.12.46 Explain the four main types of temperature inversions.

100.14 Clouds and Precipitation

100.14.2 Describe how clouds are formed.

100.14.4 Explain how atmospheric temperature, moisture and stability affect cloud formation.

100.14.6 Identify and describe the four major lifting agents which cause clouds to form.

100.14.8 Identify and classify the major cloud types.

100.14.10 Define the elements necessary for the formation of precipitation.

100.14.12 Define the process of coalescence and deposition.

100.14.14 Describe the different forms of precipitation.

100.14.16 Describe the various characteristics of precipitation.

100.16 Visibility and Wind

100.16.2 Describe the causes of visibility variation and their effects on air traffic operations.

100.16.4 Explain in general terms visibility measurement.

100.16.6 Describe the characteristics and the effect on visibility distance, of the following:

(a) precipitation

(b) fog or mist

(c) haze

(d) smoke

(e) sea spray

(f) snowstorms

(g) volcanic ash

(h) slant range

(i) sandstorms.

100.16.8 Explain how wind is generated in the atmosphere and its effect on aviation.

100.16.10 Explain the three forces which affect wind generation.

100.16.12 Explain diurnal variation of wind.

100.16.14 Explain converging and diverging wind.

100.16.16 Explain how the relationship between pressure gradient and wind speed and direction is affected by local conditions.

100.18 Weather Systems and Basic Forecasting

100.18.2 Describe general weather circulations in the atmosphere and their effect on global weather patterns.

100.18.4 Describe the idealised world circulation pattern.

100.18.6 Describe the Coriolis effect and its resultant influence on weather circulation patterns.

100.18.8 Describe how westerly winds are formed.

103.18.10 Explain global patterns of weather and their effect on understanding and forecasting weather.

100.18.12 Describe an air mass, including size, temperature and humidity.

100.18.14 Describe the characteristics of different air masses, including source regions and classification.

100.18.16 Describe and explain the likely weather conditions in Australasia during warm and cold airstream advection.

100.18.18 Describe the following:

(a) cold, warm, stationary, occluded fronts

(b) wind and weather sequence associated with each type of front

(c) movement of fronts and pressure systems.

100.18.20 Describe the weather conditions associated with tropical cyclones.

100.20 Hazardous Weather Conditions

100.20.2 Define wind shear.

100.20.4 Describe the causes of wind shear.

100.20.6 Describe the effects of wind shear on aircraft operations.

100.20.8 Identify the responsibility of ATC to report actual or suspected wind shear.

100.20.10 Define fog.

100.20.12 Explain the different conditions that can cause fog.

100.20.14 Describe the operational problems associated with fog.

100.20.16 Describe the conditions required for the formation of thunderstorms.

100.20.18 Describe the stages of a thunderstorm.

100.20.20 Describe the main thunderstorm types.

100.20.22 Describe the major hazards to aviation associated with thunderstorms.

100.20.24 Explain the origin and development of tornadoes and state the main hazards.

100.20.26 Describe the meteorological conditions favourable to icing.

100.20.28 Describe the different types of airframe icing.

100.20.30 Describe the effects of ice accretion on aircraft.

100.20.32 Identify ATC responsibilities with respect to information on icing.

100.20.34 Describe the conditions that generate turbulence, the major types of turbulence and any associated localized phenomena.

100.20.36 Describe how turbulence is categorized and reported by ATS and aircrew, including ATC considerations when significant turbulence is known or forecast.

100.20.38 Describe the mountain wave (standing, or lee wave) process.

100.20.40 Explain the phenomenon of aquaplaning, including its effect on the control of an aircraft.

100.22 ATS Meteorological Responsibility

100.22.2 Describe the practices and services of the Papua New Guinea National Weather Service.

100.22.4 Demonstrate the ability to decode the following aeronautical meteorological messages:

(a) METAR and AUTO METAR

(b) SPECI

(c) TAF

(d) SIGMET

(e) BWR.

100.22.6 State the meteorological definitions.

100.22.8 State the meteorological information supplied to aircraft by ATS.

100.22.10 State the process when meteorological information is received from aircraft.

100.22.12 Describe the process for broadcast of meteorological information by automatic terminal information service (ATIS).

100.22.14 State and define the ICAO terms for describing the presence of water on a runway.

100.22.16 State the requirements for reporting wind, including:

(a) period of observation

(b) wind direction

(c) crosswind component

(d) multiple anemometers

(e) wind shear.

100.22.18 Describe how cloud and cloud base are reported.

100.22.20 Explain the process for passing QNH values, including:

(a) aerodrome QNH

(b) local aerodrome QNH source(s) not available

(c) zone area QNH

(d) AWS reports

(e) AWS decoding.

100.22.22 State the information that ATS shall pass to aircraft:

(a) prior to taxiing for take-off

(b) prior to take-off.

100.22.24 State the meteorological reports to be passed by approach control to arriving IFR flights.

100.22.26 State the meteorological reports to be passed by aerodrome control to arriving VFR flights.

100.22.28 State the weather elements changes required for updating the take-off and/or landing reports.

100.22.30 State when there is a requirement to pass significant changes and variation in take-off and landing reports.

100.22.32 Describe the requirements for METAR and SPECI reporting, including:

(a) information regarding observation of volcanic activity

(b) how visibility shall be expressed in meteorological reports

(c) accuracy of observation

(d) timeliness of METAR and SPECI reports.

100.22.34 State the time criteria for the passing of MET information.

Navigation

100.24 The Earth

100.24.2 Define the shape of the earth and its rotation.

100.24.4 Explain the points on a compass.

100.24.6 Explain, for the purposes of any navigation, the means of earth divisions.

100.24.8 Define the units of measure used in air navigation and how they are determined.

100.24.10 List the symbols used in navigational units of measure.

100.24.12 Explain the principle of operation of a magnetic compass and its limitations.

100.24.14 Explain the principles of earth's magnetism.

100.24.16 Explain the difference between true and magnetic north and relevance for accurate navigation.

100.26 Navigational Basics

100.26.2 Explain the principle and functions of the navigational computer.

100.26.4 Explain the principles of basic air navigation in terms of flight plotting, including:

(a) vector quantities

(b) wind velocity

(c) ways of expressing direction:

i. heading (HDG)

ii. track (TR)

(d) drift

(e) speed:

i. ground speed (GS)

ii. effect of wind on different speeds of aircraft.

100.26.6 Explain the triangle of velocities, including:

(a) variables

(b) rules

(c) one-in-sixty (1:60) rule:

i. correction to heading

ii. use of 1:60 rule in ATC.

100.26.8 Explain the various methods used for an aircraft reporting its position, including:

(a) latitude and longitude

(b) other methods of expressing position

(c) geographical

(d) line features

(e) bearing and distance

(f) reporting abeam

(g) estimates at future positions.

100.26.10 Explain the basic principles of time measurement as appropriate to air traffic control.

100.26.12 Explain the relationship between time and longitude.

100.26.14 Explain how to convert between local, GMT and UTC.

100.26.16 Define what sunrise, sunset and twilight are.

100.28 Maps and Aeronautical Charts

100.28.2 Explain the principles of projections and basic types of projections.

100.28.4 Describe map scale used in air navigation charts.

100.28.6 Define methods of indicating scale, elevation and associated legends on aeronautical maps and charts.

100.28.8 Describe the appropriate use and interpret features and symbols, of the following:

(a) aeronautical charts

(b) aerodrome chart

100.30 Radio Theory

100.30.2 Explain the properties of electromagnetic radiation and their use in radio communication and navigation.

100.30.4 Explain the properties of electromagnetic waves.

100.30.6 Explain how radio waves can be propagated above the earth.

100.30.8 Explain wireless radio communication.

100.30.10 Explain the operation and limitations of the following aerials:

(a) VHF direction finding

(b) automatic direction finding

(c) non-directional beacons.

100.32 Navigation Equipment

100.32.2 Explain the operation and limitations of a VOR.

100.32.4 Explain the operation and limitations of a DME.

100.32.6 Define the following acronyms:

(a) NDB

(b) ADF.

100.32.8 Describe how an NDB operates.

100.32.10 Describe the limitations of an NDB.

100.32.12 List the components of an ILS.

100.32.14 Explain the operating principles of the localiser, glide path and markers.

100.32.16 Explain the different categories of ILS approaches.

100.32.18 Explain the operational use of an ILS.

100.32.20 Explain the principle of area navigation with particular reference to inertial navigation and global navigation satellite systems.

Aircraft

100.34 Principles of Flight

100.34.2 Identify the forces acting on an aircraft in flight, and explain the basic relationship between them.

100.34.4 Explain Bernoulli's Theorem and its relevance to an aerofoil.

100.34.6 Identify the three main factors affecting lift that can be controlled by the pilot.

100.34.8 Explain stalling, including the basic means of stall recovery.

100.34.10 Identify and explain the two main types of drag, and outline the impact of drag on aircraft performance.

100.34.12 Describe what an aerofoil is and distinguish between different aerofoil designs.

100.34.14 Describe the three axes of rotation of an aircraft.

100.34.16 Name the movements about the three axes of rotation.

100.34.18 Describe the primary aerodynamic controls and their basic functions.

100.34.20 Describe the importance of lift augmentation in modern aircraft, including devices used to achieve lift.

100.36 Aircraft Engines

100.36.2 Describe the principles of aircraft propulsion and basic types of power plant.

100.36.4 Identify the effects of thrust on aircraft in flight.

100.36.6 Identify the effect of altitude on aircraft fuel efficiency.

100.36.8 Describe the operation of the different types of aircraft engines:

(a) piston

(b) jet (including turbofan)

(c) turbo prop.

100.36.10 Describe asymmetric flight.

100.38 Aircraft Systems and Instruments

100.38.2 Describe in basic terms the main operating systems of modern day aircraft.

100.38.4 Identify meaning of the following acronyms: APU, FMS, GPWS, TCAS, STCA, MSAW, ACARS.

100.38.6 Explain the significance of aircraft depressurization for ATC.

100.38.8 Describe in basic terms the principles of helicopter aerodynamics, controls and operating hazards.

100.38.10 Explain in general terms the operation of an emergency locator transmitter (ELT, ELBA or ELB), including:

(a) state the frequency(ies) on which the ELT transmits

(b) state the requirements for the carriage of an ELT

(c) explain how an ELT can be activated

(d) describe the requirements associated with ELT testing

(e) describe the procedures for inadvertent ELT activation.

100.38.12 State the procedures to be followed on receiving an ELT signal.

100.38.14 Explain the operation of aircraft transponders.

100.40 Principles of Altimetry

100.40.2 Define the terms used in altimetry.

100.40.4 List types of errors that affect the operation of a pressure altimeter.

100.40.6 Describe how to adjust pressure settings.

100.40.8 Describe the difference between QFE and QNH.

100.40.10 Describe the application of the transition layer and how the altimeter should be adjusted when passing the transition layer and transition altitude.

100.40.12 Calculate pressure and density altitude.

100.42 Airspeed

100.42.2 Describe the components of an airspeed indicator and principles of operation.

100.42.4 Describe density error and its relevance to ATC.

100.42.6 Identify and describe the three types of airspeed, including the relationship between them.

100.42.8 Describe compressibility of the air and its significance to flight.

100.42.10 Define critical mach number, and describe the use of sweepback.

100.42.12 Define ground speed and the effect of wind on aircraft performance.

100.44 Aircraft Performance and Categories

100.44.2 Describe in general terms the common aircraft types and airline operators in PNG.

100.44.4 State the ICAO aircraft type designators, categories and operator designators for the most commonly used aircraft in PNG.

100.44.6 Describe in general terms the following parameters for typical commercial aircraft a controller will encounter:

(a) cruise range speed

(b) climb and descent performance.

100.44.8 Explain in general terms the factors that can affect aircraft performance.

100.44.10 Explain turn radius as it relates to aircraft performance.

100.44.12 Explain in general terms cruise speeds and climb performance for helicopters and light aircraft.

100.44.14 Explain in general terms the evolution of aircraft type names for example Piper.

100.44.16 Explain the phenomenon of aquaplaning, including its effect on the control of an aircraft.

100.46 Wake Turbulence

100.46.2 Explain how wake turbulence is generated and the impact on aircraft operations.

100.46.4 Identify environmental conditions affecting wake turbulence.

100.46.6 Describe the aircraft configuration that generates the most wake turbulence.

100.46.8 Identify appropriate phraseology for issuing cautionary advice of wake turbulence.

100.46.10 List the ICAO approach categories.

100.46.12 Explain helicopter wake turbulence.

Aircraft Operations

100.48 Circuit Operations

100.48.2 Describe the general design and layout of an aerodrome.

100.48.4 Explain the numbering system and orientation of runways.

100.48.6 Describe designated positions in the traffic circuit.

100.48.8 State the requirements for an aircraft reporting its position in the circuit.

100.50 IFR Operations

100.50.2 Explain in general terms IFR procedures.

100.50.4 Explain in general terms the different types of minimum flight altitudes.

100.50.6 Describe the different types of IFR departure procedures.

100.50.8 Explain the requirements and considerations for noise abatement procedures.

100.50.10 Describe the types of instrument approach procedures in common use at Papua New Guinea's aerodromes.

100.50.12 Describe the elements of an instrument approach procedure, including:

(a) inbound track

(b) outbound track

(c) outbound timing or distance

(d) missed approach procedure.

100.50.14 Interpret instrument approach charts.

100.50.16 Describe in general terms types of different instrument holding procedures.

100.50.18 List the ICAO approach categories.

Air Traffic Services

100.52 General

100.52.2 Explain the objectives of air traffic services.

100.52.4 State the categories air traffic services are divided into.

100.52.6 Describe the general parameters for coordination between air traffic services and aircraft operator representatives.

100.54 Airspace

100.54.2 Identify the sectors within Papua New Guinea's area of responsibility.

100.54.4 Identify the classes of airspace used in Papua New Guinea, and describe the separation requirements for each class.

100.54.6 Define transponder mandatory airspace and identify appropriate acronyms.

100.54.8 Define domestic controlled airspace categories and identify appropriate acronyms.

100.54.10 Explain airspace classification.

100.54.12 Describe the different airspace designations.

100.54.14 Describe the various types of special use and other hazardous airspace, including identifying appropriate acronyms.

100.56 Air Traffic Control Service

100.56.2 Define air traffic control service.

100.56.4 Explain the responsibility for the provision of an air traffic control service.

100.56.6 Explain traffic priorities within controlled airspace.

100.56.8 Describe the procedures to follow when it becomes apparent air traffic demand will exceed the available capacity of the ATC system.

100.56.10 Define air traffic management (ATM) and air traffic flow management (ATFM).

100.56.12 Explain in general terms the tools used for implementing ATFM.

100.56.14 Describe aircraft priorities with regard to aircraft known or believed to be in a state of emergency or impaired operation.

100.56.16 Describe which activities can be granted priority and how a pilot will ask for priority.

100.56.18 Describe aircraft priorities for the use of the airspace or maneuvering area.

100.56.20 Describe the priorities given to flight inspection aircraft.

100.58 Flight Progress System

100.58.2 Describe the purpose of the flight progress system, specifically with regard to the use of flight progress strips, including electronic strip system.

100.58.4 Define flight progress system.

100.58.6 Describe how a blocking strip is used.

100.58.8 Describe what and how information is recorded on flight progress strips, including abbreviations and symbols.

100.58.10 Describe the importance of accurate and concise recording of data on flight progress strips.

100.60 Flight Information Service

100.60.2 Define the flight information service (FIS).

100.60.4 Describe the scope of the FIS.

100.60.6 Explain the responsibility for the provision of the FIS.

100.60.8 Describe the information passed to a flight on first contact.

100.60.10 Explain the purpose of traffic information.

100.60.12 List the correct order that traffic information shall be given.

100.60.14 Define traffic avoidance advice and its use.

100.60.16 Describe the requirements for exchange of movement data for non-controlled flights.

100.60.18 State when new or amended flight information shall be offered.

100.60.20 Describe what information shall be provided to VFR flights.

100.60.22 Describe the function of the Port Moresby flight information centre.

100.60.24 Describe the area of responsibility of the Christchurch flight information centre and delegation of airspace.

100.60.26 State the priority in the provision of an air traffic control service and a flight information service.

100.62 Alerting Service

100.62.2 Define the alerting service.

100.62.4 Describe the scope of the alerting service.

100.62.6 Explain the responsibility for the provision of the alerting service.

100.62.8 Explain the alerting service emergency phases.

100.62.10 Identify the three alerting phases, including name, acronym and definition.

100.62.12 Demonstrate good working knowledge of the contents of an in-flight emergency response checklist.

100.62.14 Explain the process of initial checks carried out to confirm the operational status of an aircraft.

100.62.16 Describe SARTIME.

100.62.18 Describe the process for PY RCC/ Police/CASA notification.

100.62.20 State where you would locate information on procedures and initial actions for handling aviation accidents and incidents.

100.62.22 Identify the three aerodrome emergency phases.

100.62.24 Identify when an alerting service emergency phase shall be declared.

100.62.26 Identify ATS response in the event of an emergency.

100.62.28 Describe the use of the speechless technique using unmodulated transmissions, and list the components of the code to be used.

100.62.30 Describe the means by which a pilot may notify a state of emergency or distress, and identify the associated frequencies and squawk codes to be used.

100.62.32 Outline the actions of ATS following notification of an aircraft emergency from a source other than an ATS unit.

100.62.34 State the procedures to be followed on receiving an ELT signal.

100.62.36 Describe the procedures for ELT testing and inadvertent ELT activation.

100.64 Search and Rescue

100.64.2 Explain in general terms the PYRCC.

100.64.4 Describe the search and rescue classes applicable in Papua New Guinea.

100.66 ATS Equipment

100.66.2 Describe the components of the aeronautical fixed service facilities.

100.66.4 Describe the aeronautical fixed telecommunications network.

100.66.6 Describe the principles of operation of primary surveillance radar.

100.66.8 Describe the limitations of primary radar coverage and performance.

100.66.10 Describe the principles of operation of secondary surveillance radar.

100.66.12 Describe the limitations of secondary radar coverage and performance.

100.66.14 Describe the information displayed, including radar symbols, on the situation display.

100.66.16 Explain the working principles and use of MLAT in ATC.

100.66.18 Explain the working principles and use of ADSB in ATC.

100.66.20 Explain the working principles and use of Mode S in ATC.

100.66.22 Explain in general terms known future developments.

100.66.24 Explain the link between surveillance systems with the automated ATC system.

100.66.26 Explain in general terms the automated FDP/RDP system.

100.66.28 Explain in general terms the FDPS RDPS interface.

100.66.30 Explain in general terms the controller work position (CWP) interface to RDPS/ RFDPS.

100.66.32 Describe the data displayed, including functions available, on the electronic data display

100.66.34 Describe the visual aids including limitations and accuracy for arriving aircraft.

100.68 Equipment Failure

100.68.2 Explain the impact of a partial or complete failure of the following ATS equipment, including, but not limited to:

(a) flight data processing system

(b) radar data processing system

(c) AFTN

(d) navigation aids

(e) voice communication system

(f) main and standby power supply.

100.70 ATS messages

100.70.2 Define ATS messages.

100.70.4 Describe the different categories of ATS messages and their priorities.

100.70.6 Explain the process for transmission of ATS messages.

100.70.8 Describe the process for preparation of ATS message for use via AFTN, including:

(a) priority indicator

(b) addressing of messages

(c) supplementary information on the address and origin

(d) filing time

(e) origination of messages

(f) originator indicator.

100.70.10 Explain the requirements for standard ATS message contents and data conventions.

100.70.12 Describe flight information messages.

100.70.14 Describe abbreviated flight plan message procedures.

100.72 Flight Planning

100.72.2 Describe requirements for filing a VFR flight plan.

100.72.4 Define SARTIME.

100.72.6 Define flight rules Y and flight rules Z.

100.72.8 Describe in general terms VFR flight plans, including:

(a) when required

(b) elements

(c) activation

(d) amendment

(e) termination

(f) SARTIME

(g) terms and abbreviations.

100.72.10 Describe in general terms IFR flight plans, including:

(a) when required

(b) elements

(c) activation

(d) amendment

(e) termination

(f) SARTIME

(g) terms and abbreviations.

100.72.12 Describe the following commonly used flight plan types:

(a) RPL

(b) EPL

(c) FPL

(d) CPL.

100.72.14 Identify when pilots are requested to pass POB information to an ATS unit.

100.72.16 Describe the methods for filing flight plans.

100.72.18 Describe the process for acceptance for VFR and IFR flight plans.

100.74 FDP and Flight Plan Handling

100.74.2 Explain the requirement for FDPS flight plan handling including:

(a) creation of flight plans

(b) creation of short term flight plans

(c) mixed flight rules

(d) use of full registration

(e) aircraft types

(f) flight plan route field requirements

(g) IFR aerial work/activity flight plans

(h) flight plan other field

(i) manual entry of data block scratch pad

(j) activation of flight plans

(k) deletion of flight plans

(l) flights cancelling IFR and proceeding VFR

(m) flights cancelling VFR and proceeding IFR

(n) flight plan handling for diverting flights

(o) use of correct NAV and COM abbreviations and associated PBN data.

100.74.4 Explain SSR code management.

100.74.6 Describe the requirements when entering a FPL into the FDPS for the following:

(a) generic aircraft types, available when the actual aircraft type is unknown

(b) block level requests

(c) bearing and distance

(d) latitude and longitude

(e) filing options when a pilot intends to 'loiter' enroute e.g. military or aerial survey, including who to advise

(f) ambulance flights, aerial surveys, aerial photography, training, route description change, VIP and PBN data entered into section 18 of a flight plan.

100.76 Coordination

100.76.2 Describe the general coordination criteria for the provision of air traffic services, including:

(a) information about which agreement must be reached

(b) when coordination is required.

100.76.4 State the various methods of coordination.

100.76.6 Describe the procedures relating to estimate messages.

100.76.8 Identify the requirements for revisions to estimates messages.

100.76.10 State the standard phraseologies for revisions.

100.76.12 Identify when an approval request is required.

100.76.14 Describe the procedures associated with transfer of radio guard.

100.78 FDP and Coordination

100.78.2 Explain the automatic distribution of flight plan data/messages within the flight data processing system (FDPS).

100.78.4 Explain the limitations of automatic exchange of ATS data in coordination.

100.78.6 Explain in general terms the postings and flight plan ownership of the FDP.

100.78.8 Explain in general terms the handover functions for flight plans in the FDP.

100.78.10 Explain in general terms the FDP flight plan process for an IFR flight requesting a clearance.

100.80 ATC Clearances

100.80.2 Describe the procedures associated with clearances and instructions, including the contents, limits and read-back requirements.

100.80.4 Define an ATC clearance and identify how a clearance should be used.

100.80.6 Identify a pilots' responsibility regarding clearances.

100.80.8 Describe an ATC clearance.

100.80.10 State what a clearance to a VFR aircraft shall provide.

100.80.12 List the phrases to be used to authorise an aircraft to operate in controlled airspace.

100.80.14 Identify how a clearance limit shall be described.

100.80.16 Describe under what circumstances a controller may withhold a clearance, and the exceptions to this.

100.82 Separation

100.82.2 Name the general separation types.

100.82.4 Describe the vertical separation minima.

100.82.6 Define same track, reciprocal tracks, and crossing tracks.

100.82.8 Identify and explain the main types of horizontal separation.

100.82.10 Describe visual separation and how it is applied in the vicinity of an aerodrome.

100.82.12 Identify the requirement to have another separation in place prior to the expiry of the initial separation standard.

100.82.14 Explain separation standards in regard to airspace classification, including the separation of "maintaining own separation in VMC".

100.82.16 Describe the requirements for increasing and reducing separation.

100.82.18 Describe the controller actions to be taken in the event of a loss of separation.

100.82.20 List the elements of essential traffic information.

100.82.22 Describe the situations where air traffic control is responsible for the provision of separation between IFR and VFR flights, IFR and SVFR flights, and between SVFR flights.

Human Factors

100.84 Human Performance

100.84.2 Define the study of human performance.

100.84.4 Identify and describe the components of the information processing model.

100.84.6 Describe the blame and train model.

100.84.8 Describe the Reason model.

100.84.10 Describe the SHEL model.

100.84.12 Describe the principles of higher cognitive functioning, its errors and limitations.

100.84.14 Define situational awareness, and identify ways in which it can be eroded.

100.84.16 Describe the limitations of auditory and visual perception.

100.84.18 Identify and analyse using conceptual models the human factor contributions to incidents and accidents.

100.84.20 Describe skill, rule and knowledge-based behaviours and their associated errors.

100.84.22 Describe subjective and performance cues, and identify cues which can indicate work overload in air traffic controllers.

100.84.24 Identify the hazards associated with quiet work periods and post-high traffic periods in ATC.

100.84.26 Describe the difference between short-term and long-term memory including capacity.

100.84.28 Identify the hazard of visual illusion in a tower environment with respect to determining sequence of aircraft.

100.84.30 Identify the hazards of hearback errors and the tools a controller uses to minimize the attendant risk of incident.

100.84.32 Identify and describe the principle aspects of group behaviour.

100.84.34 Describe the communication process in terms of changes to the information passed on, and consequent potential for miscommunication.

100.84.36 Identify and describe types of communication.

100.84.38 Identify and describe barriers to communication.

100.86 Fatigue and Fitness

100.86.2 Describe hypoxia and identify pressurization as the means of prevention.

100.86.4 Describe the significance of sleep and circadian rhythm with respect to shift work.

100.86.6 Describe the types of fatigue and how these are overcome.

100.88 Equipment and Workspace Design

100.88.2 Explain the importance of ergonomics with regard to controller performance.

100.88.4 Describe physical ergonomics.

100.88.6 Describe cognitive ergonomics.

100.88.8 List the physical and cognitive ergonomic considerations in an ATC environment.

100.88.10 Describe parallax error.

100.88.12 Describe common errors in display interpretation.

100.88.14 Describe the basic requirements of alerts.

100.88.16 Describe problems associated with the presentation and misinterpretation of alerts.

100.88.18 Describe how colour coding conventions are used.

100.88.20 Describe the effect of environment on the provision of air traffic services including:

(a) workplace ergonomics

(b) weather

(c) workplace and equipment design.

100.90 Stress Management

100.90.2 Explain methods of identifying stress.

100.90.4 Explain the difference between acute and chronic stress.

100.90.6 Describe the physiological and psychological effects of stress.

100.90.8 Identify symptoms of personal stress.

100.90.10 Describe the cause and effects of stress.

100.90.12 Describe stress management techniques applicable in an air traffic service environment.

100.90.14 Describe the factors that improve personal stress tolerance.

100.90.16 Describe the relationship between stress and fatigue.

100.90.18 Explain methods of managing stress.

100.90.20 Describe the relationship between performance and stress, including the role of the limbic system.

100.90.22 Identify the importance of physical exercise and relaxation techniques in the reduction of stress.

100.92 Systemic Approach to Aviation Safety

100.92.2 Describe the importance of having standard procedures and documentation in order to contain human error.

100.92.4 Identify the importance of standard procedures with respect to minimizing human error.

100.92.6 Identify key aspects that contribute to the effectiveness of procedures.

100.92.8 Identify the meaning of the acronym NOSS, and describe what NOSS is and is not designed to achieve in an ATC environment.

100.92.10 Identify and describe features that would be apparent in an organization nurturing safety.

100.92.12 Describe the threat and error management model including its significance to air traffic control.

100.92.14 Define the components of the TEM model.