Section 2 Air Traffic Services

Chapter 1 Air Traffic Services

1 Introduction

1.1 Air traffic services within the Republic of South Africa are provided in accordance with the Civil Aviation Regulations and Technical Standards. Generally these are in line with the standards and recommended practices of the International Civil Aviation Organisation.

1.2 The Civil Aviation Technical Standards - Air Traffic Services - Standards and Procedures, contains standards and procedures to civilian controllers providing air traffic services.

2 Air Traffic Services

2.1 Air traffic service is a generic term meaning variously:

a) Air traffic control service;

b) Air traffic advisory service;

c) Flight information service;

d) Alerting service.

3 Objectives of Air Traffic Services

3.1 The objectives of Air Traffic Services are to:

a) Prevent collisions between aircraft;

b) Prevent collisions between aircraft moving on the manoeuvring area and between aircraft and obstructions on the manoeuvring area;

c) Expedite and maintain a safe and orderly flow of air traffic;

d) Provide advice and information useful for the safe and efficient conduct of flights;

e) Notify appropriate organisations regarding aircraft in need of SAR and to assist such organisations as required.

Note The objectives of air traffic services as prescribed above do not include prevention of collision between aircraft in flight and terrain or obstacles thereon, so that the procedures prescribed do not relieve the pilot from the responsibilities for ensuring that any instructions or clearances issued by air traffic services are safe in this respect. When an IFR flight is vectored by any means of ATS surveillance, air traffic control is responsible for ensuring adequate terrain clearance.

3.2 Divisions of the air traffic services

The air traffic services shall comprise three services identified as follows:

3.2.1 An air traffic control service is provided according to the particular circumstances and class of airspace. It may comprise one or more of the following:

a) Aerodrome control service, **the provision of air traffic control service for aerodrome traffic, in order to accomplish objectives a), b) and c), of 3.1**

b) Approach control service, with or without the aid of radar; t**he provision of air traffic Control service for those parts of controlled flights associated with arrival or departure, in order to accomplish objectives a) and c), of 3.1**

c) Area control service, with or without the aid of radar, **the provision of air traffic control service for controlled flights, in order to accomplish objectives a) and c), of 3.1**

3.2.2 The *flight information service*, to accomplish objective d) of 3.1.

3.2.3 The *alerting service,* to accomplish objective e) of 3.1

3.3 **Safety and Expedition**

3.3.1 The provision of an air traffic control or advisory service should be based upon expedition consistent with safety. In complex environments the benefits of deviating from basic procedures in order to expedite traffic should be carefully considered against the extent of co-ordination required and the attendant risk of error. The controller should deviate from the basic procedures only when he is quite sure that the resultant co-ordination can be carried out without excessive workload and without detriment to the safety of traffic under his control.

3.3.2 Where controllers are working together they should, whenever possible, pay attention to each other's actions in order to provide an additional safeguard against errors or omissions.

4 Airspace Organisation and Management

4.1 All airspace within the borders of the Republic is the concern of ATM and is a useable resource. The ATM service provider, in conjunction with the SANDF is responsible for the flexible allocation and the usage of airspace based on the principles of access and equity. The airspace is organised and managed in a manner that will accommodate all current and potential new uses of airspace.

4.2 Airspace organisation and management will provide the first layer of conflict management. Effective airspace organisation and management will enhance the ability of the ATM service provider and airspace users to accomplish conflict management and also increase ATM system safety, capacity and efficiency.

4.3 The airspace is organised to facilitate handling of flights and the ability for flights to be conducted along optimum flight trajectories from gate to gate without undue restriction or delay.

5 Combining Functions of an ATSU

5.1 An ATSU may undertake one or more of the following ATS functions.

5.1.1 Approach Control may be combined with Aerodrome Control, in which case the combined service will be identified by the call-sign of the TWR, i.e. ...(Name of aerodrome)...Tower.

5.1.2 Air Traffic Advisory Service or Flight Information Service may be combined with Area Control, in which case the combined service will be identified by the call-sign of the Area Control, i.e. name of city or sector.

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Chapter 2 Division of Airspace

1 General

1.1 In order to facilitate the provision of air traffic services, the airspace is divided as detailed in the following paragraphs.

1.2 Particulars of the various airspaces implemented within the RSA can be obtained from the SA-AIP.

2 Flight Information Regions

2.1 Flight information regions are airspace's of defined dimensions within which flight information service and alerting services are provided.

2.2 The RSA airspace is divided into three flight information regions (FIR). These being the Johannesburg FIR, Cape Town FIR and Oceanic FIR.

2.3 ICAO Regional Meetings determine the boundaries of the FIRs in order to allocate responsibility for the provision of the ATS to specified States.

2.4 States are expected to divide the airspace's within their FIRs into the following types of airspace as necessary for the efficient provision of the ATS to the expected air traffic;

a) Controlled Airspace's;

b) Advisory Airspace's; and

c) Information Airspaces.

2.5 Classification of Airspaces

2.5.1 The classification of the airspace within a flight information region determines the flight rules which apply and the minimum services which are to be provided.

Note: *Refer to SA-CATS 172.02.2 for the classification of airspaces.*

2.6 Controlled Airspace

2.6.1 Aircraft operating in these airspaces are provided with full air traffic control service in accordance with airspace classification. Controlled airspace is sub-divided into the following types:

Airspace Type	Airspace Classification	Exceptions
a) Aerodrome Traffic Zone	B, C, D or E	
b) Control Zone	B, C, D or E	
c) Control Area	B, C, D or E	No VFR flights permitted above FL195.
d) Terminal Control Area	B or C	
e) ATS route	B, C, D or E	No VFR flights permitted above FL195.
f) Oceanic	A	IFR only above FL245.

2.7 **Uncontrolled Airspace**

2.7.1 **Advisory Airspace**

2.7.1.1 In advisory airspace all participating IFR flights receive an air traffic advisory service and *all* flights receive flight information service if requested.

2.7.2 **Information Airspace**

2.7.2.1 Air Traffic Control Service is not provided in uncontrolled airspace, only information useful to the safe and efficient conduct of flights is provided.

2.8 **Designated Uncontrolled Airspaces**

2.8.1 **Aerodrome Traffic Zone Class G**

This includes the provision of Aerodrome Flight Information Service.

2.8.2 **Flying Training Areas**

These designated flying areas are indicated as danger areas on aeronautical charts and are described in the SA-AIP.

2.8.3 **Prohibited, Restricted or Danger Areas**

These are indicated on aeronautical charts and may intrude into or be encircled by Controlled or Advisory Airspace.

2.8.4 **Information Routes**

These are frequently flown routes through uncontrolled airspace and are shown on charts by a single line with the appropriate code letter of the route number and the letter "F" e.g. W86F.

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Chapter 3 ATS System Capacity and Air Traffic Flow Management

1 Capacity Management

1.1 General

1.1.1 The capacity of an ATS system depends on many factors, including the ATS route structure, the navigation accuracy of the aircraft using the airspace, weather related factors and controller workload. Every effort should be made to provide sufficient capacity to cater for both normal and peak traffic levels; however, in implementing any measures to increase capacity the responsible ATM service provider shall ensure that the processes as contained in the Safety Management System are complied with and that safety levels are not compromised in any way.

1.1.2 The number of aircraft provided with an ATC service shall not exceed that which can be safely handled by the ATSU concerned under the prevailing circumstances. In order to define the maximum number of flights which can be safely accommodated, the responsible ATM service provider shall assess and declare the ATC capacity for control areas, for control sectors within a control area, for approach sectors within a terminal manoevering area and for aerodromes.

1.1.3 ATC capacity should be expressed as the maximum number of aircraft which can be accepted over a given period of time within the airspace or at the aerodrome concerned.

Note: *The most appropriate measure of capacity is likely to be the sustainable hourly traffic flow. Such hourly capacities can, for example, be converted into daily, monthly or annual values.*

1.2 Capacity Assessment

1.2.1 In assessing capacity values, factors to be taken into account should include the following:

a) The level and type of ATS provided;

b) The structural complexity of the control area, terminal manoevering area and associated sectors or the aerodrome concerned;

c) Controller workload, including control and coordination tasks to be performed;

d) The types of communications, navigation and surveillance systems in use, their degree of technical reliability and availability as well as the availability of back-up systems and/ or procedures;

e) Availability of ATC systems providing controller support and alert functions; and

f) Any other factor or element deemed relevant to controller workload.

Note: *Summaries of techniques which may be used to estimate control sector/ position capacities are contained in the "Air Traffic Services Planning Manual" (Doc 9426).*

1.3 Regulation of ATS Capacity and Traffic Volumes

1.3.1 Where traffic demand varies significantly on a daily or periodic basis, facilities and procedures should be implemented to vary the number of operational sectors or working positions to meet the

prevailing and anticipated demand. Applicable capacities and procedures shall be contained in the ATSU SSI Manual.

1.3.2 In case of particular events which have a negative impact on the declared capacity of an airspace or aerodrome, the capacity of the airspace or aerodrome concerned shall be reduced accordingly for the required time period. Whenever possible, the capacity pertaining to such events should be predetermined.

1.3.3 To ensure that safety is not compromised whenever traffic demand in an airspace or at an aerodrome is forecast to exceed the available ATS capacity, measures shall be implemented to regulate traffic volumes accordingly.

1.4 Enhancement of ATS Capacity

1.4.1 The responsible ATM service provider should:

a) Periodically review ATS capacities in relation to traffic demand; and

b) Provide for flexible use of airspace in order to improve the efficiency of operations and increase capacity.

1.4.2 In the event that traffic demand regularly exceeds ATS capacity resulting in continuing and frequent traffic delays, or it becomes apparent that forecast traffic demand will exceed capacity values, the responsible ATM service provider should as far as practicable:

a) Implement steps aimed at maximising the use of the existing system capacity; and

b) Develop plans to increase capacity to meet the actual or forecast demand.

1.5 Flexible Use of Airspace

1.5.1 The Central Airspace Management Unit (CAMU) through the establishment of agreements and procedures make provision for the flexible use of all airspace in order to increase airspace capacity and to improve the efficiency and flexibility of aircraft operations.

1.5.2 Agreements and procedures providing for a flexible use of airspace should specify the following:

a) The horizontal and vertical limits of the airspace concerned;

b) The classification of any airspace made available for use by civil air traffic;

c) Units or authorities responsible for transfer of the airspace;

d) Conditions of transfer of the airspace to the ATC unit concerned;

e) Conditions for transfer of the airspace from the ATC unit concerned;

f) Periods of availability of the airspace;

g) Any limitations on the use of airspace concerned; and

h) Any other relevant procedures or information.

2 Air Traffic Flow Management

2.1 General

2.1.1 An air traffic flow management (ATFM) service shall be implemented for airspace where traffic demand at times exceeds the defined ATS capacity.

2.1.2 ATFM should be implemented on the basis of a multilateral agreement where collaborative decision making takes place.

2.1.3 Certain flights may be exempt from ATFM or be given priority over other flights

2.2 Flow Management procedures

2.2.1 ATFM should be conducted in three phases, these being:

a) *Strategic planning* – This stage will begin as soon as practicable when actions are carried out more than one day before the day on which it will take place. Strategic planning is normally carried out well in advance i.e. two to six months ahead. At the strategic stage, demand and capacity balancing will respond to the fluctuations in schedules and demands, including the increasing globalization of traffic patterns, as well as the seasonal changes of weather and major weather phenomena. Through collaborative decision-making, assets will be optimised to maximize throughput, thus providing a basis for predictable scheduling;

b) *Pre-tactical planning* - This stage is the action to be taken on the day before the day on which the plan will take effect. At the pre-tactical stage, demand and capacity balancing will evaluate the current allocation of ATM service provider, airspace user and aerodrome operator assets and resources against the projected demands. Through collaborative decision making, when possible, adjustments will be made to assets, resource allocations, projected trajectories, airspace organization and allocation of entry/exit times for aerodromes and airspace volumes to mitigate any imbalance;

c) *Tactical operations* – This is the stage where the implementation of the measures planned during the previous two stages occurs. Demand and capacity balancing will focus more closely on demand management to adjust imbalances. It will consider weather conditions, infrastructure status, resource allocations, and disruptions in schedules that would cause an imbalance to arise. Through collaborative decision making, these actions will include dynamic adjustments to the organisation of airspace to balance capacity; dynamic changes to the entry/exit times for aerodromes and airspace volumes; and adjustments to the schedules by users.

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Chapter 4 Military Operations

1 Responsibility In Regard To Military Traffic

1.1 It is recognised that some military aeronautical operations necessitate non-compliance with certain air traffic procedures. In order to ensure the safety of flight operations the SANDF shall be asked, whenever practicable, to notify the proper air traffic control unit prior to undertaking such manoeuvres.

1.2 A reduction of separation minima required by military necessity or other extraordinary circumstances shall only be accepted by an air traffic control unit when a specific request in some recorded form has been obtained from the authority having jurisdiction over the aircraft concerned and the lower minima then to be observed shall apply only between those aircraft. Some recorded form of instruction fully covering this reduction of separation minima must be issued by the air traffic control unit concerned.

1.3 Temporary airspace reservation, either stationary or mobile, may be established for the use of large formation flights or other military air operations. Arrangements for the reservation of such airspace shall be accomplished by coordination between the user and the ATM service provider, in this case the CAMU.

2 Responsibility in Respect of Military Aircraft in Controlled Airspace's

2.1 Military aircraft operating in controlled airspace's at civil aerodromes shall comply with civil air traffic control procedures and ATSUs shall provide them with normal air traffic services and facilities.

2.2 Military aircraft operating in the FIR outside of controlled airspaces and outside of designated military flying areas will normally comply with civil air traffic procedures.

2.3 When deemed necessary by the appropriate military authority, military aircraft may operate in such areas without complying with normal air traffic procedures.

2.4 ATSUs will provide all known military aircraft operating in the FIR with normal air traffic services and facilities.

3 Formation Flights

3.1 Flights of military aircraft operating as a formation on the same flight plan, and flying or intending to fly in IMC, may request ATC clearance for flights within controlled airspace's. In order to avoid undue delay to military or civil traffic, clearance may be granted for such flights provided the aircraft of such formations can maintain separation from each other visually, and are able to communicate with the formation leader.

3.2 The identification of the leader of the formation must be shown on the flight plan, together with the number of aircraft in the flight, and all ATC communications and clearances should be addressed to the leader.

3.3 If the weather conditions encountered are such that the aircraft of the formation are unable to maintain separation visually, the leader will inform ATC. On receipt of such a message ATC will:-

a) If practicable, take action to obtain normal separation standards between all aircraft in the formation as quickly as possible, using radar if available;

b) If normal separation cannot be obtained, the aircraft shall be given as much separation from each other as is possible and the formation given directions to enable them to leave controlled airspace by the shortest possible route.

3.4 In all cases where such clearances are requested, the controller of the ATSU concerned is to ensure that the leader of the formation is aware of the conditions of the clearance as detailed above.

3.5 The ATSU concerned is to ensure that the issuance of such clearances will not delay or in any way adversely affect normal civil flying operations.

4 **Reduced Weather Minima for SAAF Helicopters**

4.1 SAAF helicopters are authorised to operate outside of controlled airspace below 700ft above the ground or water and clear of cloud with a flight visibility of ¼ NM (453 metres).

4.2 SAAF helicopters may be granted Special VFR clearance to operate in a CTR clear of cloud with a ground visibility of ¼ NM (453 metres). Apart from the reduced weather minima, SAAF helicopters are subject to the normal rules for special VFR in CTRs as detailed in CAR 91.06.21.

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Chapter 5 Flight Rules

1 Rules of Flight Types

1.1 Flights are classified into types according to the flight rules (regulations) under which the flight is conducted. The flight rules, which are detailed in the CAR & CATS, are:-

a) Instrument Flight Rules (IFR);

b) Visual Flight Rules (VFR);

c) Special Visual Flight Rules (SVFR).

1.2 All flights shall be conducted in accordance with the Rules of the air, CAR Part 91-Subpart 6, and either as a VFR, IFR or a Special VFR flight.

2 Visual Flight Rules

2.1 A VFR flight shall be conducted so that the aircraft is flown:-

a) With visual reference to the surface by day and to identifiable objects by night and at no time above more than scattered cloud within a radius of 5NM of the aircraft in flight; and

b) In conditions of visibility and distance from cloud equal to or greater than those specified below:

Type of Airspace	Flight Visibility	Distance From Cloud Vertical - Horizontal	
CTR – ATZ Class C or G	5KM/ 3NM	500 Feet	500 Feet
All Other Airspaces			
At or below 1000' above the surface by day only.	1.5KM	Clear of Clouds	
Above 1500' up to FL100 above the surface by day and night.	5KM	500 Feet	2000 Feet
Above FL100 up to and including FL200 by day and night.	8KM	1000 Feet	1.5KM

Note: *When a pilot of an aircraft maintains two way radio communication with a TWR or AFIS unit, that aircraft may, in respect of a cross country flight, leave or enter the ATZ Class C or G, as the case may be, when the ground visibility is equal to or greater than 5km and the ceiling is equal to or higher than 500FT.*

2.3 When an aircraft is flying in meteorological conditions equal to or greater than those in the table above, the aircraft is said to be in Visual Meteorological Conditions (VMC). A VFR flight shall always be conducted in VMC.

2.4 When an aircraft is flying in meteorological conditions less than those specified above, the aircraft is said to be in Instrument Meteorological Conditions (IMC).

2.5 Unless authorised by ATC on a Special VFR clearance, no VFR flight shall take off from, land at, or approach to land at an aerodrome within a CTR or fly within the Control Zone when the ground visibility is less than 1500m and/or the ceiling is less than 600ft.

Note: *When an aircraft maintains two-way radio communications with the control tower or aerodrome flight information service unit, that aircraft may, in respect of a cross-country flight, leave an ATZ Class C (Which does not comprise of a CTR or part thereof) or an ATZ Class G, when the ground visibility is equal to or greater than 5km and the ceiling equal to or higher than 500ft.*

2.6 South African Aviation Legislation does not forbid VFR flights by night, however, irrespective of the weather, ATCs should encourage all flights capable of operating under IFR and intending to operate in any Controlled, Advisory or Information airspace, except flights which do not intend leaving the aerodrome traffic circuit, to operate under IFR.

2.7 VFR flight within South Africa is not permitted above FL195 unless special dispensation has been granted by the Commissioner Civil Aviation in writing.

Note: *Controllers are to take cognisance that neighbouring International FIRs comply with the ICAO standard of FL145 for all VFR operations.*

3 Instrument Flight Rules

3.1 Aircraft may be flown in accordance with IFR irrespective of the meteorological conditions, however all aircraft flying above FL195 shall comply with IFR.

4 Changing From IFR to VFR Flight

4.1 Change from IFR to VFR flight is only acceptable when the pilot uses the specific expression "Cancel my IFR flight", together with changes to be made to his current flight plan.

4.2 No invitation to change from IFR to VFR is to be made by ATC, either directly or by inference.

4.2.1 The pilot on deciding to cancel the IFR flight plan and continue with VFR shall advise the ATC in the following manner: *"…cancelling IFR request to route VFR…"*

4.3 This change in the flight rules should be acknowledged by ATC with the phrase *"IFR flight cancelled at ..... (Time)."*

4.4 If an ATSU, accepting the change from IFR to VFR has reason to believe that IMC may be encountered along the route of flight, the pilot should be advised.

4.5 This change in the flight rules only affects the entries in Fields 8 and 15 of the flight plan and does not constitute a cancellation of the entire flight plan or the cancellation of search and rescue.

Note: *Pilots should consider the impact of the change to VFR on the Radio Communication Failure procedure before changing to VFR.*

5 Special VFR

5.1 A special VFR flight is a flight subject to prior authorisation from ATC but not subject to IFR and conducted by day, within a CTR within which compliance with IFR has been declared mandatory.

5.2 The minimum weather conditions under which the ATC may grant special VFR clearances are:-

a) By day only,

b) Within sight of ground;

c) Clear of cloud; and

d) With a ceiling of at least 600 feet and a ground visibility of not less than 1500m, except that for SAAF helicopters, ground visibility of one-quarter nautical mile shall apply.

5.3 Standard separation shall be provided between all special VFR flights and between special VFR flights and aircraft operating under IFR.

5.4 IFR flights must not be delayed in order to accommodate requests for a Special VFR clearance.

5.5 Authorisation for Special VFR flights will depend on local traffic conditions and other factors such as the extent of the flight proposed and whether air-ground communication can be maintained; i.e.

it could require a shorter time interval between IFR flights to accommodate a Special VFR flight which can maintain radio contact with APP and report positions etc., than one which cannot do so.

5.6 ATC shall specify the conditions under which a Special VFR flight may be made, e.g. if the aircraft is equipped with an operational radio and Mode C transponder, ATC may specify that the pilot maintains radio guard and makes position reports while in the CTR or ATC may prescribe the route to be followed by the aircraft. ATC may also place time restrictions on a Special VFR clearance, such as "Clearance expires at .....(Time)....." etc.

5.7 Aircraft operating Special VFR within a CTR when the zone has been declared IMC will not normally be given a specific altitude to fly; pilots will merely be instructed to remain clear of cloud and within sight of ground. If, however, it is necessary to provide vertical separation from aircraft above, the Special VFR aircraft is to be instructed not to fly above a specified altitude e.g. *"Cleared" ……..... (Route) .....Special VFR, clear of cloud, in sight of ground, not above .....feet".*

5.8 Special VFR flights are intended to provide flexibility to pilots who are unable to comply with IFR. This flexibility however excludes those aircraft in the training category and will be instructed to remain on the ground.

5.9 Special VFR absolves the pilot-in-command from complying with IFR; however, it does not absolve the pilot-in-command from the responsibility of maintaining the minimum safe altitude prescribed in the CAR 91.06.32(1) (a) (b) (c).

5.10 A flight may be authorised for SVFR operation within a CTR to:

a) Enter a CTR for the purpose of landing;

b) Take-off and depart from a CTR;

c) To cross a CTR;

d) *Operate locally within a CTR.

Note: ****This authorisation may include those aircraft that are engaged in crime-prevention or medevac operations.***

6 Types of Approaches

6.1 IFR in Controlled Airspace

In controlled airspace the ATSU shall provide standard ATC separation while the pilot shall be responsible for terrain clearance criteria.

6.1.1 Instrument Approach

a) If standard instrument approach and missed approach procedures are published, no specific instructions need be given. If, however, the pilot requests information on the procedure, the following shall be passed to him:-

i. Type of approach and facility;

ii. Initial approach altitude;

iii. Outbound track in degrees magnetic;

iv. Procedures turn (left or right);

v. Final approach track in degrees magnetic;

vi. Obstacle clearance limit;

vii. Missed approach procedure, when deemed necessary.

b) Even if visual reference to the ground is established before completion of the approach procedures, a pilot will normally complete the entire procedure. At his request, however, clearance may be granted to break off the instrument procedure and proceed directly to the airfield visually. Nevertheless, they will continue to be an IFR flight unless they choose to change to VFR flight rules in VMC and cancels their IFR flight plan.

c) Where Instrument Approach Procedures exists for the destination airport in controlled airspace an IFR flights normally complete an Instrument Approach Procedure.

d) Aircraft executing VMC, Visual or Instrument approaches under approach control need not be separated by the standard minima from traffic operating within the aerodrome traffic circuit under aerodrome control.

e) A particular approach procedure may be specified to expedite traffic. The omission of a specified approach procedure will indicate that *any* authorised approach may be used at the discretion of the pilot. Thus care should be taken to specify the approach intended for the aircraft when clearance for the approach is given to prevent the crew complying with a different than planned approach i.e. completing a VOR Non-precision approach instead of an ILS Precision approach.

6.1.2 **Visual Approach**

a) To expedite traffic IFR flights may be cleared to execute visual approaches, whilst still maintaining IFR Flight Plan status, when:

i. The pilot can maintain visual reference to the terrain; *and*

ii. The reported cloud ceiling is above the initial approach altitude;

OR

The pilot reports at the Initial approach level or at any time during instrument approach procedure that the meteorological conditions are such that with reasonable assurance a visual approach and landing can be completed; *and*

iii. The aircraft is within 25NM of the destination aerodrome;

iv. A Visual Approach may be requested by the pilot or initiated by an ATC. When initiated by the ATC the concurrence of the pilot is required.

v) The reported ceiling is at or above the level of the beginning of the initial approach segment for the aircraft so cleared; or

vi)) The pilot reports at the level of the beginning of the initial approach segment or at any time during the instrument approach procedure that the meteorological conditions are such that with reasonable assurance a visual approach and landing can be completed

Note: *The following RT may be used:*

Pilot request: *"Field (terrain) in sight, request visual approach".*

ATC response: *"…….. (callsign) are you able to accept a visual approach runway…?"*

b) During a visual approach the ATSU shall remain responsible to provide separation between all aircraft. The pilot shall remain responsible for terrain clearance as well as remaining within controlled airspace.

c) Controllers shall exercise caution in initiating a visual approach when there is reason to believe that the flight crew concerned is not familiar with the aerodrome and its surrounding terrain. Controllers should also take into consideration the prevailing traffic and weather conditions when initiating visual approaches.

d) Standard separation shall be provided between an aircraft cleared to execute a visual approach and all other controlled flights.

Note 1: *The term visual approach is only associated with an instrument approach procedure, where the Instrument Approach is abbreviated in total or in part.*

Note 2: *Separation may be based upon pilot or ATC sighting and maintaining visual separation between succeeding aircraft in the vicinity of an aerodrome.*

Note 3: *When an aircraft is receiving vectors, a clearance for a visual approach shall only be issued when a pilot reports the aerodrome in sight OR the preceding aircraft in sight, at which time the vectoring/control will be terminated; however the aircraft will still be provided with* an ATS surveillance *service.*

6.1.3 **Approach Maintaining VMC**

a) A VMC Approach enables the pilot to descend below the initial approach altitude while maintaining VMC.

b) An IFR flight in controlled airspace may be cleared by ATC to execute a VMC Approach, whilst still maintaining IFR Flight Plan status, when:

i. Requested by the pilot;

Note: *The following RT may be used by the pilot:*

"…request VMC Approach…"

ii. Metrological conditions are such that there is reasonable assurance that a VMC Approach and landing can be completed;

iii. The pilot can maintain visual reference to the terrain.

c) During a VMC Approach the ATSU shall remain responsible to provide separation between all aircraft as stipulated below:

i. *BY DAY:* Standard separation may be reduced, subject to the agreement of all pilots involved. When such a reduction is permitted, essential traffic information shall be passed and the pilot is responsible for his own separation.

ii. *BY NIGHT:* ATC shall ensure that standard separation is applied to all flights.

d) During a VMC Approach the pilot shall remain responsible for terrain clearance.

Note 1: *It is not required to change the IFR status of a flight to VFR when a Visual Approach or VMC approach is made in controlled airspace.*

Note 2: *Due to the nature of traffic situations at busy aerodromes the reduction of separation may not be feasible.*

Note 3: *To meet the requirements for separation, "Reduced Separation in the Vicinity of the Aerodrome" may be applied.*

6.2 IFR Flights Leaving Controlled Airspace

6.2.1 When leaving controlled airspace, the ATSU shall provide standard ATC separation until the aircraft has vacated controlled airspace. ATSU approval is required when descending out of controlled airspace to ensure separation from other traffic within controlled airspace. Where an information service is provided outside of controlled airspace, the pilot shall be provided with traffic information.

6.2.2 The pilot shall remain responsible for terrain clearance criteria throughout.

6.2.3 An IFR flight in controlled airspace routing towards an uncontrolled aerodrome may be descended by the ATSU to the lowest limit of the controlled airspace. Further descent below the limit of controlled airspace shall be at the discretion of the pilot.

6.2.4 Where a radar control service is provided in controlled airspace, the aircraft may be descended by the ATSU to the lowest limit of the controlled airspace, or to the radar terrain clearance limit whichever is higher. Further descent below this must be made at the discretion of the pilot.

6.2.5 In that phase of flight where the pilot requests descent that will take the aircraft outside of controlled airspace, the following RT may be used:

Pilot: "Request further descent maintaining VMC" or "Request further descent into uncontrolled airspace"

ATC: "Descend as required and report leaving controlled airspace"

***Note 1**: Radar Control Service can only be provided in controlled airspace.*

***Note 2:** The ATSU and the pilot shall have joint responsibility for terrain clearance only while the aircraft is provided with a radar vectors.*

***Note3:** The lowest limit of the controlled airspace or the radar terrain clearance may not comply with the minimum level required for IFR flights as stipulated in SA-CAR Part 91.06.32 and Part 91.07.2 respectively.*

6.3 **IFR in uncontrolled airspace**

6.3.1 An aircraft may not be *cleared* by an ATSU for a visual approach or a VMC approach in uncontrolled airspace.

6.3.2 Where an Information Service is provided outside of controlled airspace, the pilot will be given traffic information and the pilot shall remain responsible for own separation and terrain clearance criteria throughout.

6.3.3 An IFR flight in uncontrolled airspace may execute a cloud-break procedure, whilst still maintaining IFR Flight plan status.

6.4 **VMC Approach in Uncontrolled Airspace**

6.4.1 An IFR flight in uncontrolled airspace may execute a VMC approach whilst still maintaining IFR flight plan status, when in VMC and:

a) Metrological conditions are such that there is reasonable assurance that a VMC approach and landing can be completed; and

b) The pilot can maintain visual reference to the terrain.

Section 2 Air Traffic Services

Chapter 6 Altimeter Setting Procedure

1 Introduction

1.1 The following procedures describe the methods intended for use in providing adequate vertical separation between aircraft and terrain during all phases of flight. The methods are based on the following principles:

a) During flight, when at or below a fixed altitude called the transition altitude, an aircraft is flown at altitudes determined from an altimeter set at sea level pressure (QNH) and its vertical position is expressed in terms of altitude;

b) During flight above the transition altitude an aircraft is flown along surfaces of constant atmospheric pressure based on an altimeter setting of 1013.2 Hectopascals and throughout this phase of a flight the vertical position of an aircraft is expressed in terms of flight level;

c) The change in reference from altitude to flight levels, and vice versa, is made, when climbing, at the transition altitude and, when descending, at the transition level;

d) The adequacy of terrain clearance during any phase of a flight may be maintained in a number of ways, depending upon the facilities available in a particular area, the recommended methods in the order of preference being:-

i) The use of current QNH reports from any adequate network of QNH reporting stations;

ii) The use of such QNH reports available combined with other meteorological information such as the forecast lowest mean sea level pressure for the route or portions thereof;

iii) Where current information is not available, the use of values of the lowest altitudes of flight levels, derived from climatological data.

e) During the approach to land, terrain clearance may be determined by using the QNH altimeter setting (giving altitude) or a QFE setting (giving height above the QFE datum).

f) Altimeter settings shall be given in hPa in four digits together with the unit of measurement used, and shall be rounded down to the nearest lower whole hPa.

2 System of Flight Levels

2.1 Flight level zero shall be located at the atmospheric pressure level of 1013.2 hPa. Consecutive flight levels shall be separated by a pressure interval corresponding to at least 500ft (152.4 meters) in the Standard Atmosphere.

2.2 Flight levels shall be numbered according to the following table which indicates the corresponding height in the Standard Atmosphere in feet:-

Flight Level Number	Height In Standard Atmosphere (1013.2 hPa)		Flight Level Number	Height In Standard Atmosphere (1013.2 hPa)	
	Feet	Meters		Feet	Meters
10	1,000	300	50	5,000	1,500
15	1,500	450	…	…..	…..
20	2,000	600	100	10,000	3,050
25	2,500	750	…	…..	…..
30	3,000	900	150	15,000	4,550
35	3,500	1,050	…	…..	…..

40	4,000	1,200		200	20,000	6,100
45	4,500	1,350		…	…..	…..
				500	50,000	15,250

2.3 Minimum cruising level

2.4 Area control centres shall, when circumstances warrant it, determine the lowest usable flight level or levels for the whole or parts of the control area for which they are responsible, and use it when assigning flight levels and pass it to pilots on request.

2.5 Assignment of Cruising Levels

2.5.1 In so far as practicable, cruising levels of aircraft flying to the same destination shall be assigned in a manner that will be correct for an approach sequence at the destination.

2.5.2 An aircraft at a cruising level shall normally have priority over other aircraft desiring that cruising level. When two or more aircraft are at the same cruising level, the preceding aircraft shall normally have priority.

2.5.3 Except when traffic conditions and co-ordination procedures permit authorisation of cruise climb, an ATC unit shall normally authorise only one cruising level for an aircraft beyond its control area, i.e. that level at which the aircraft will enter the next control area whether contiguous or not. It is the responsibility of the accepting ATC unit to issue clearance for further climb as appropriate. When relevant, aircraft will be advised to request en route any cruising level changes desired.

2.5.4 Aircraft authorised to employ cruise climb techniques shall be cleared to operate between two flight levels or above a specified level.

3 Transition Altitude

3.1 A transition altitude is specified for each aerodrome in the SA-AIP or AICs and shall be indicated on the appropriate charts.

3.2 The transition altitude for all points of departure and arrival within 25 nautical miles of any aerodrome listed in the SA-AIP or AICs shall be the same as that listed for the relative aerodrome.

3.3 In the case of VMC flights departing from, or arriving at points beyond 25 nautical miles from any of the aerodromes listed shall observe the height of 2000ft above the ground or water as the transition altitude.

3.4 In the case of IMC flights departing from, or arriving at points beyond 25 nautical miles from any of the aerodromes listed shall observe the lowest safe cruising altitude as the transition altitude.

3.5 Where two or more closely spaced aerodromes are located so as to require coordinated procedures, a common transition altitude shall be established. This common transition altitude shall be the highest of the transition altitudes that would result for the aerodromes if separately considered.

3.6 The height above the aerodrome of the transition altitude shall be as low as possible; normally this should not be less than 3,000 ft.

3.7 The calculated height of the transition altitude shall be rounded up to the next full ~~1,000~~ ***100ft.***

4 Transition Levels

4.1 Transition levels will be adjusted when barometric pressure changes beyond specified limits so that the transition level will never be less than 1000ft above the transition altitude.

4.2 The Air Traffic Service Unit at aerodromes will provide the current transition level for their aerodrome, including points within 25 nautical miles of their aerodrome in the approach and landing instructions.

4.3 VMC flights intending to land at points beyond 25 nautical miles from any of the aerodromes listed shall observe the height of 3000 ft above the ground or water as the transition level.

4.4 In IMC, flights intending to land at points beyond 25 nautical miles from any of the aerodromes listed, shall observe the flight level 500ft above the lowest safe altitude as the transition level.

4.5 Where two or more closely spaced aerodromes are located so as to require coordinated procedures and a common transition altitude, a common transition level shall be used at any one time.

Note: *The transition level is normally passed to aircraft in the approach and landing clearances.*

5 Transition from Flight levels to Altitudes and Vice Versa

5.1 The vertical position of an aircraft when at or below the *transition altitude* shall be expressed in terms of *altitude*.

5.2 The vertical position of an aircraft when at or above the *transition level* shall be expressed in terms of *flight levels*.

5.3 While passing through the transition layer, vertical position shall be expressed in terms of flight levels when ascending and in terms of altitude when descending.

6 Take-Off and Climb

6.1 A QNH altimeter setting shall be made available to aircraft in taxi instructions prior to take-off.

6.2 A QFE altimeter setting shall be made available to aircraft upon request if available.

6.3 On reaching the transition altitude at least one altimeter in the aircraft shall be set to 1013.2 hPa (29.92 inches of mercury) and thereafter the vertical positioning of the aircraft shall be referred to in flight levels.

Note: *On reaching the transition altitude pilots will re-set their altimeters to 1013.2 hPa without requesting ATC permission to do so, nor is it necessary to advise ATC that the change has been made.*

7 En-Route

7.1 Vertical Separation

7.1.1 Vertical separation of aircraft during en-route flight at and below the transition altitude shall be assessed in terms of altitude.

7.1.2 Vertical separation of aircraft during en-route flight above the transition altitude shall be assessed in terms of flight levels.

7.1.3 Aircraft shall be flown at altitudes or flight levels as applicable corresponding to the magnetic tracks as indicated in the "Semi-circular Table".

7.2 **Terrain Clearance**

7.2.1 The SAWS will make available to pilots, on request, the forecast lowest en-route QNH, to enable pilots to determine the lowest flight level which will ensure adequate terrain clearance for routes or segments of routes on which this information is required.

7.2.2 The lowest safe flight level may be determined by one of the following ways:-

a) If there is more than one altimeter in the aircraft, set the sub-scale of one of them to the forecast lowest QNH. The readings of this altimeter can then be compared with the elevations shown on the map of the aircraft's route to ensure that the minimum 1500ft terrain clearance, where applicable does exist, or

b) Make a pre-flight check to ensure that the flight level selected will provide the minimum terrain clearance by determining the relationship which will exist between the forecast lowest QNH and the altimeter sub-scale setting (1013.2 hPa).

Note: *The danger signal is when the QNH is lower than the sub-scale setting the aircraft will be lower than indicated.*

8 Approach and Landing

8.1 A QNH altimeter setting shall be made available to aircraft in approach clearances and in clearances to enter the traffic circuit.

8.2 A QFE altimeter setting, clearly identified as such, should be made available in approach and landing clearances on request.

8.3 The vertical positioning of aircraft during approach shall be controlled by reference to flight levels until reaching the transition level below which vertical positioning shall be reference to altitudes, except as provided for in paragraph 8.4.

Note: *This does not preclude a pilot from using a QFE setting for terrain clearance purposes during the final approach to the runway.*

8.4 After an approach clearance has been issued and the descent has commenced, the vertical positioning of an aircraft above the transition level may be by reference to altitude (QNH), provided that level flight above the transition altitude is not indicated or anticipated.

Note: *This exception is intended to apply primarily to turbine engine aircraft for which an uninterrupted descent from a high altitude is desirable.*

8.5 On reaching the transition level, pilots will reset their altimeters to the QNH without requesting ATC permission to do so, nor is it necessary to advise ATC that the change has been made.

9 Missed Approach

9.1 The relevant parts of the previous paragraphs 6, 7, and 8 shall apply in the event of a missed approach.

10 Procedures Applicable to ATSUs

10.1 General

10.1.1 ATSUs shall ensure that the latest QNH is always readily available for transmission to aircraft and for determining the current transition level.

10.1.2 ATSUs shall pass to aircraft the QFE on request if available.

10.1.3 Both of these settings must be rounded *down* to the nearest whole hPa before being transmitted to the pilot. However, the settings are to be given to the nearest tenth of a hPa if requested.

10.2 Responsibility for Determining the Current Transition Level

10.2.1 Approach control is responsible for determining and providing to arriving aircraft the current transition level for their CTR. This level will also apply as the transition level for any arriving aircraft landing within 25NM of that ATSU.

10.2.2 At manned aerodromes which are not within a CTR, the TWR or AFISU shall be responsible for determining the transition level for their aerodrome and for any arriving aircraft landing within 25NM of the aerodrome.

10.2.3 On commencement of the shift or at such other times as specified in the SSI Manual, either approach control, TWR or AFIS as applicable shall ascertain the current QNH and determine from it the current transition level.

10.2.4 Approach control, TWR or AFIS as applicable must at all times be on the alert for changes in the QNH which will necessitate a change in the current transition level accordingly without delay.

10.3 Determination of the Current Transition Level

10.3.1 Transition levels shall be determined with reference to the requirements as per the unit SSI Manual.

10.3.2 In the table below, the current QNH must be applied to the table relevant to the station. The flight level indicated against the pressure range within which the current QNH falls, shall be the current transition level.

10.3.3 This table ensures 1000 feet vertical separation between an aircraft at transition altitude and one at transition level.

10.3.4 The critical stage is reached when the QNH value drops to the QNH figure given in the first column of the table. Immediately the QNH drops below this figure the transition level must be changed in accordance with the table without delay.

10.3.5 QNH pressures at which transition level shall be altered:

QNH in hPa		
959	-	977
978	-	995
996	-	1013
1014	-	1032
1033	-	1050
1051	-	above

10.3.6 All ATSUs should include in their SSI Manual a table as shown below in relation to their own transition level.

Example:

Alexander Bay	Transition Altitude	QNH			Transition Level
	6,000ft	959	-	977	85
		978	-	995	80
		996	-	1013	75
		1014	-	1032	70
		1033	-	1050	65
		1051	-	above	60

10.4 Recording of Transition Level in Force

10.4.1 On opening or the commencement of a shift, or at such other time as specified in the Station Standing Instruction Manual, the official meteorological QNH and transition level shall be entered into the occurrence log.

10.4.2 Whenever it becomes necessary to change the transition level, an entry to that effect, giving the QNH and transition level introduced shall be made in the occurrence log.

10.5 Check on Pressure Sensor Instruments

10.5.1 At least once per shift the pressure sensor instrument at an ATSU should be checked for accuracy against the QNH obtained from the meteorological office.

10.5.2 Whenever the QNH value is updated from the meteorological office, it is to be compared with the QNH value it replaces or against the pressure sensor instrument for obvious errors.

10.5.3 Any discrepancy of 3 hPa or more of the QNH value it replaces, or than the reading obtained from the pressure sensor instrument, must be reported to the meteorological office immediately and the correct QNH value verified.

Section 2 Air Traffic Services

Chapter 7 Semi-Circular Rule

1 Flights Obliged To Comply With the Semi-Circular Rule

1.1 The following flights are obliged to comply with the Semi-Circular Rule when in level cruising flight:

a) IFR flights outside of controlled airspaces;

b) VFR flights, except those operated in class B, C, D and E airspace's, operating at 1500ft or more above the surface of the earth;

c) All flights at night outside of controlled airspaces.

2 Semi-Circular Rule Table

2.1 When complying with the Semi-Circular rule, aircraft shall be flown at flight level corresponding to the magnetic tracks shown in the following table:

Magnetic Tracks			
000° to 179° Odd		*180° to 359° Even*	
IFR Flight Level	*VFR Flight Level*	*IFR Flight Level*	*VFR Flight Level*
10	-	*20*	-
30	*35*	*40*	*45*
50	*55*	*60*	*65*
Etc. to	*Etc. to*	*Etc. to*	*Etc. to*
	195		*185*
	No VFR flights above FL195		*No VFR flights above FL195*
410		*400*	
Then		*then*	
450		*430*	
490		*470*	
etc.		*etc.*	

Aircraft that are not RVSM approved may not operate between FL290 to FL410 inclusive unless the aircraft status is a State aircraft.

Note: *In the case of tracks where the changes of magnetic variation encountered between navigational aids would change the magnetic track from one semi-circle to the other, the mean variation should be used. Where the track falls on the dividing line when using mean variation, the variation used must be greater than the mean. The ATSU concerned with routes where this happens must liaise to ensure that they are both using the same*

variations, thus ensuring that opposite traffic selects flight levels from different columns in the table.

Section 2 Air Traffic Services

Chapter 8 Flight Plans

1 Filing of Flight Plans

1.1 The filing of a flight plan is mandatory in the following cases:

a) International flights;

b) All flights in the public transport operation or public transport of cargo operation categories;

c) All flights for which overdue action is required;

d) All flights operating between aerodromes where an ATSU is operating.

1.2 Flight plans shall also be filed for all flights conducted in controlled or advisory airspace's, provided that this requirement shall not apply if:-

a) It is a local flight;

b) It is going to cross an airway or advisory route at right angles;

c) A VFR flight departing from, or arriving at an aerodrome within an ATZ Class C/ G or a CTR, and the remainder of the flight will be conducted clear of all controlled and/or advisory airspaces.

Note 1: *Flight plans may be filed for any flight.*

Note 2: *For compilation of a flight plan see Section 9, Chapter 5.*

1.3 Flight plans for IFR flights within controlled, advisory and information airspaces should be filed in sufficient time before ETD to allow the ATSU to fit the intended flight into the traffic pattern. ATC may, if necessary, insist on:-

a) Thirty minutes warning before take-off when the point of departure is within a CTR or when the flight will be joining controlled or advisory airspace almost immediately after take-off; or

b) Ten Minutes warning before controlled or advisory airspace will be entered when filed in flight.

1.4 In the event of a delay of thirty (30) minutes in excess of the estimated off-block time for a scheduled flight or a delay of one hour for an non-scheduled or general aviation flight for which a

flight plan has been submitted, the flight plan should be amended or a new flight plan submitted and the old flight plan cancelled, whichever is applicable.

1.5 A flight plan to be submitted during flight should normally be transmitted to the ATSU in charge of the FIR, control area, advisory area or advisory route in or on which the aircraft is flying; or in, or through which the aircraft wishes to fly or to the aeronautical telecommunication station serving the ATSU concerned. When this is not practicable, the flight plan should be transmitted to another ATSU for retransmission as required to the appropriate ATSU.

1.6 Where relevant, such as in respect of ATSUs serving high or medium density airspace, the ANSP should prescribe conditions and/or limitations with respect to the submission of flight plans during flight to those specified sectors.

Note: *If the flight plan is submitted for the purpose of obtaining air traffic control service, the aircraft is required to wait for an air traffic control clearance prior to proceeding under the conditions requiring compliance with air traffic control procedures.*

If the flight plan is submitted for the purpose of obtaining air traffic advisory service, the aircraft is required to wait for acknowledgment of receipt by the unit providing the service.

2 Acceptance of a Flight Plan

2.1 The first air traffic services unit receiving a flight plan or any changes shall:

a) Check it for compliance with the format and data conventions;

b) Check it for completeness and, to the extent possible, for accuracy;

c) Take action, if necessary, to make it acceptable to the air traffic services; and

d) Indicate acceptance of the flight plan or change thereof, to the originator.

2.2 Acceptance of IFR Flight Plans

2.2.1 The filing of an IFR flight plan indicates that the pilot is qualified and that the aircraft is equipped for IFR flight and further, that the pilot-in-command will conform to all provisions of IFR.

2.2.2 This does not preclude an ATC from verifying whether a pilot is qualified or whether the aircraft is suitable equipped for IFR flight when the controller has reason to believe otherwise.

3 Repetitive Flight Plans (RPL)

3.1 The repetitive flight plan scheme is a more convenient method of filing flight plans for flights that operate regularly. Only one plan is filed and the details are brought forward for each flight.

Note: *The procedures governing the use of RPL's are contained in ICAO Doc 4444, Chapter 16, paragraph 16.4.*

4 Booking Out

4.1 Pilots who do not file a flight plan are required to inform the air traffic service unit at the aerodrome of their departure where the filing of a flight plan is not mandatory. This is referred to as booking out. The air traffic service unit is to record the departure. No further action is required.

Section 2 Air Traffic Services

Chapter 9 Air traffic Control Clearances

1 General

1.1 Clearances are issued solely for expediting and separating air traffic and are based on known traffic conditions which affect safety in aircraft operation. Such traffic conditions include not only aircraft in the air and on the manoeuvring area over which control is being exercised, but also any vehicular traffic or other obstructions not permanently installed on the manoeuvring area in use.

1.2 If an air traffic control clearance is not suitable to the pilot-in-command of an aircraft, the flight crew may request and, if practicable, obtain an amended clearance.

1.3 The issuance of air traffic control clearances by ATSUs constitutes authority for an aircraft to proceed only in so far as known air traffic is concerned. ATC clearances do not constitute authority to violate any applicable regulations for promoting the safety of flight operations or for any other purpose; neither do clearances relieve a pilot-in-command of any responsibility whatsoever in connection with a possible violation of applicable rules and regulations.

1.4 ATC units shall issue such ATC clearances as are necessary to prevent collisions and to expedite and maintain an orderly flow of air traffic.

1.5 ATC clearances shall be issued early enough to ensure that they are transmitted to the aircraft in sufficient time for flight crews to comply with the contents of the clearance.

2 Contents of Air Traffic Control Clearances

2.1 Clearances shall contain positive and concise data and shall, as far as practicable, be phrased in a standard manner.

2.2 Clearances shall contain the following in the order listed:

a) Aircraft identification;

b) Clearance limit;

c) Route of flight;

d) Level(s) of flight for the entire route or part thereof and changes of levels if required;

e) Any necessary instructions or information on other matters such as SSR transponder operation, approach or departure manoeuvres, communications and the time of expiry of the clearance.

Note: *The time of expiry of the clearance indicates the time after which the clearance will be automatically cancelled if the flight has not been started.*

2.3 Additional instructions included in clearances relating to levels shall consist of:

a) Cruising level(s) or, for cruise climb, a range of levels, and, if necessary, the point to which the clearance is valid with regard to the level(s);

b) Levels at which specified significant points are to be crossed, when necessary;

c) The place or time for starting climb or descent, when necessary;

d) The rate of climb or descent, when necessary;

e) Detailed instructions concerning departure or approach levels, when necessary;

d) Any special instructions e.g. rate of climb or descent, SIDs, STARs etc.

Note: *Personnel relaying clearances to aircraft shall transmit such clearances in the exact phraseology in which they are received (See Section 8 for phraseologies).*

3 Clearance Limit

3.1 A clearance limit is the point to which an aircraft is granted an Air Traffic Control clearance and shall be specified by naming:

a) An aerodrome;

b) A significant point; or

c) A controlled airspace boundary.

3.2 An aircraft will be cleared to the aerodrome of first intended landing when:

a) The flight is planned to remain within controlled airspace throughout the flight; or

b) The flight intends to leave controlled airspace, pass through uncontrolled airspace, and re-enter controlled airspace. Such clearance will only be valid for those portions of the flight which are conducted within controlled airspace.

3.3 In both of the above cases such clearances may only be issued when:

a) Prior to departure the flight will be co-ordinated between all ATSUs concerned; or

b) There is reasonable assurance that prior co-ordination will be effected ahead of the aircraft's passage.

3.4 To make the position quite clear to pilots, the following phrase shall be added to all clearances for flights which will be leaving controlled airspace:-

"....to leave controlled airspace at ...." (CTA Boundary/CTR Boundary/ Significant position, etc).

4 Routes

4.1 Every endeavour shall be made to clear aircraft via the route or routes requested, where practicable.

4.2 The route of flight shall be detailed in each clearance when deemed necessary. The phrase *"cleared flight planned route"* may be used to describe any route or portion thereof provided the route or portion thereof is identical to that filed in the flight plan and sufficient routing details are given to definitely establish the aircraft on its route.

4.3 The phrase "*cleared flight planned route"* shall not be used when granting a reclearance.

4.4 The phrases "*cleared (designation) departure"* or *"cleared (designation) arrival"* may be used when standard departure or arrival routes have been established by the SACAA and published in the Aeronautical Information Publication (AIP).
Note.— See 6.3.2.3 pertaining to standard clearances for departing aircraft and 6.5.2.3 pertaining to standard clearances for arriving aircraft.

4.5 Subject to airspace constraints, ATC workload and traffic density, and provided coordination can be effected in a timely manner; an aircraft should whenever possible be offered the most direct routing.

5 En-route Aircraft

5.1 General

5.1.1 An ATC unit may request an adjacent ATC unit to clear aircraft to a specified point during a specified period.

5.1.2 After the initial clearance has been issued to an aircraft at the point of departure, it will be the responsibility of the appropriate ATC unit to issue an amended clearance whenever necessary and to issue traffic information, if required.

5.1.3 When requested by the flight crew, an aircraft shall be cleared for cruise climb whenever traffic conditions and coordination procedures permit. Such clearance shall be for cruise climb either above a specified level or between specified levels.

5.2 Cruising Levels

5.2.1 Normally, the cruising level requested in the flight plan is to be allocated, but if this level is not available, the nearest vacant level is to be allocated.

5.2.2 When two or more aircraft are at, or are requesting, the same cruising level, the preceding aircraft shall normally have priority.

5.3 Clearances Relating to Supersonic Flight

5.3.1 Aircraft intending supersonic flight shall, whenever practicable, be cleared for the transonic acceleration phase prior to departure.

5.3.2 During the transonic and supersonic phases of a flight, amendments to the clearance should be kept to a minimum and must take due account of the operational limitations of the aircraft in these flight phases.

6 Read-Back of Clearances

6.1 The flight crew shall read back to the air traffic controller safety-related parts of ATC clearances and instructions which are transmitted by voice. The following items shall always be read back:

a) ATC route clearances;

b) Clearances and instructions to enter, land on, take off on, hold short of, cross taxi and backtrack on any runway; and

c) Runway-in-use, altimeter settings, SSR codes, level instructions, heading and speed instructions and, whether issued by the controller or contained in automatic terminal information service (ATIS) broadcasts, transition levels.

6.2 Other clearances or instructions, including conditional clearances, shall be read back or acknowledged in a manner to clearly indicate that they have been understood and will be complied with.

6.3 The controller shall listen to the read-back to ascertain that the clearance or instruction has been correctly acknowledged by the flight crew and shall take immediate action to correct any discrepancies revealed by the read-back.

6.4 Unless specified in the SSI Manual, voice read-back of controller-pilot data link communications (CPDLC) messages shall not be required.

7 Withholding Clearance

7.1 Authorised persons are empowered to prohibit flight and they may instruct ATMSD personnel to withhold a clearance. A list of authorised persons should appear in the SSI Manual.

7.2 If a controller is instructed to withhold a take-off clearance, reasonable steps should be taken to establish the authenticity and powers of the person giving the instruction.

7.3 In addition, a controller shall withhold a take-off clearance when it is known that an aircraft has been detained.

7.4 If a controller has not been instructed to withhold clearance but has reason to believe that a planned flight is liable to endanger life or involve a breach of legislation, the controller is to:-

a) Warn the pilot of the hazardous condition, or the apparent infringement and obtain an acknowledgement of the message.

b) In the case of an infringement of legislation, warn the pilot that if he does take-off, the facts will be reported to the SACAA.

c) If the pilot still requests take-off clearance after acknowledging the warning, the pilot should be advised, when traffic permits, that there are no traffic reasons to restrict take-off.

d) Record the warning and any comment made by the pilot in the ATC occurrence log and impound the audio recording.

7.5 Whenever an aircraft has been detained, ATSU Management shall be informed immediately by the most expeditious means.

7.6 Due to possible legal action when pilots disregard the warnings described in paragraph 7.4, or when an aircraft which has been detained departs without a clearance, it is essential that clear and precise messages are passed to the pilots concerned and acknowledgements obtained.

Note: *The legislation empowering authorised persons to detain aircraft is contained in CAR Part 13.00.1(c).*

8 Priorities for the Issuance of ATC Clearances

8.1 Requests for clearances shall normally be dealt with in the order in which they are received and issued according to the traffic situation.

8.2 This order may be varied to facilitate the maximum number of flights with the least average delay. However; certain flights are given priority over others. The categorisation of these flights is given below:

a) Aircraft in emergency i.e. engine failure, fuel shortage, seriously ill person on board, ferry flights where one or more engines are inoperative and ambulance aircraft.

b) Aircraft that has declared a state of minimum fuel;

c) Normal flights which have files a flight plan i.e. scheduled services, charter, executive, private, positioning and military flights.

d) Special flights i.e. survey flights, parachute dropping etc.

e) Training flights. These flights should be accommodated into the normal traffic pattern as the opportunity occurs.

Note: *The State President and visiting Heads of State, **on official business** when so authorised, will receive priority handling.*

Section 2 Air Traffic Services

Chapter 10 Presentation and Updating of Flight Plan and Control Data

1 General

The appropriate ANSP shall establish provisions and procedures for the presentation to controllers, and subsequent updating of flight plan and control data for all flights being provided with a service

by an ATSU. Provision shall also be made for the presentation of any other information required or desirable for the provisions of ATS.

2 Information and Data to Be Presented

2.1 Sufficient information and data shall be presented in such a manner as to enable the controller to have a complete representation of the current air traffic situation within the controller's area of responsibility and, when relevant, movements on the manoeuvring area of aerodromes.

2.2 The presentation shall be updated in accordance with the progress of aircraft, in order to facilitate the timely detection and resolution of conflicts as well as to facilitate and provide a record of coordination with adjacent ATS units and control sectors.

2.3 An appropriate representation of the airspace configuration, "including significant points and information related to such points, shall be provided. Data to be presented shall include relevant information from flight plans and position reports as well as clearance and coordination data.

2.4 The information display may be generated and updated automatically, or the data may be entered and updated by licensed ATMSD personnel.

2.5 Requirements regarding other information to be displayed, or to be available for display, shall be specified by the appropriate ANSP.

3 Presentation of Information and Data

3.1 The required flight plan and control data maybe presented through the use of paper flight progress strips or electronic flight progress strips, by other electronic presentation forms or by a combination of presentation methods.

3.2 The method(s) of presenting information and data shall be in accordance with Human Factors principles. All data, including data related to individual aircraft, shall be presented in a manner minimizing the potential for misinterpretation or misunderstanding.

3.3 Means and methods for manually entering data in ATC automation systems shall be in accordance with Human Factors principles.

3.4 When flight progress strips (FPS) are used, there should be at least one individual FPS for each flight. The number of FPS for individual flights shall be sufficient to meet the requirements of the ATSU concerned. Procedures for annotating data and provisions specifying the types of data to be entered on FPS, including the use of symbols, shall be specified by the appropriate ANSP.

3.5 Data generated automatically shall be presented to the controller in a timely manner. The presentation of information and data for individual flights shall continue until such time as the data is no longer required for the purpose of providing control, including conflict detection and the coordination of tights, or until terminated by the controller.

3.6 Recording and retention of data for investigative purposes Paper FPS shall be retained for a period of at least 30 days. Electronic flight progress and coordination data shall be recorded and retained for at least the same period of time.

Section 2 Air Traffic Services

Chapter 11 Position Reporting

1 Transmission of Position Reports

1.1 On routes defined by designated significant points, position reports shall be made by the aircraft when over, or as soon as possible after passing, each designated compulsory reporting point, except as provided in paragraph 1.3. Additional reports over other points may be requested by the appropriate ATSU.

1.2 On routes not defined by designated significant points, position reports shall be made by the aircraft as soon as possible after the first half hour of flight and at hourly intervals thereafter, except as provided in paragraph 1.3. Additional reports at shorter intervals of time may be requested by the appropriate ATSU.

1.3 Under conditions specified by the appropriate ANSP, flights may be exempted from the requirement to make position reports at each designated compulsory reporting point or interval. In applying this, account should be taken of the meteorological requirement for the making and reporting of routine aircraft observations.

Note: *This is intended to apply in cases where adequate flight progress data are available from other sources, e.g. ATS Surveillance, and in other circumstances where the omission of routine reports from selected flights is found to be acceptable.*

1.4 The position reports required by in paragraphs 1.1 and 1.2 shall be made to the ATSU serving the airspace in which the aircraft is operated. In addition, when prescribed in the SA-AIP or requested by the appropriate ATSU, the last position report before passing from one FIR or control area to an adjacent FIR or control area shall be made to the ATSU serving the airspace about to be entered.

1.5 If a position report is not received at the expected time, subsequent control shall not be based on the assumption that the estimated time is accurate. Immediate action shall be taken to obtain the report if it is likely to have any bearing on the control of other aircraft.

2 Contents of Voice Position Reports

2.1 The position reports required by in paragraphs 1.1 and 1.2 shall contain the following elements of information, except that elements (4), (5) and (6) may be omitted from position reports transmitted by radiotelephony:

1. Identification;
2. Position;
3. Time;
4. Flight level or altitude;
5. Next position and estimate;
6. Ensuing significant point.

2.2 Element (4), flight level or altitude, shall, however, be included in the initial call after a change of air-ground voice communication channel/ frequency.

2.3 The full AIREP (Air Report) format consists of the following:

a) Section 1 - Position Report as per paragraph 2.1:

b) Section 2 - Operating Information**:**

7. Destination and estimated time of arrival;

8. Endurance.

c) Section 3 - Meteorological Information**:**

9. Air temperature;

10. Mean Wind or Spot Wind and position thereof or equivalent tail wind;

11. Turbulence;

12. Aircraft icing;

13. Supplementary.

2.4 When assigned a speed to maintain, the flight crew shall include this speed in their position reports. The assigned speed shall also be included in the initial call after a change of air-ground voice communication channel, whether or not a full position report is required.

Note: *Omission of element (4) may be possible when flight level or altitude, as appropriate, derived from* pressure altitude *information can be made continuously available to controllers in labels associated with the position indication of aircraft and when adequate procedures have been developed to guarantee the safe and efficient use of* this altitude *information.*

3 Action on Receipt of a Position Report

3.1 An ATSU receiving a report from an aircraft in flight, whether it is in the AIREP format or not, shall:

a) If it is intended for another ATSU, ensure that the unit it is intended for receives it, either by re-transmitting the message on the ATS/DS or by means of a message on the AFTN;

b) Ensure that the information received is recorded and/ or posted in accordance with the SSI Manual;

c) Pass any meteorological information included in the message promptly to the appropriate SAWS office;

c) Pass any operational information to local operator's representatives and/ or enquiry desk in accordance with the SSI Manual.

4 Radiotelephony Procedures for Air-Ground Voice Communication Channel Changeover

4.1 The initial call to an ATC unit after a change of air-ground voice communication channel shall contain the following elements:

a) Designation of station being called;

b) Call sign, and for aircraft in the heavy wake turbulence category, the word “Heavy” and for aircraft in the super heavy wake turbulence category (A380), the word “super heavy” ;

c) Level, including passing and cleared levels if not maintaining the cleared level;

d) Speed, if assigned by ATC; and

e) Additional elements, as required by ATC.

4.2 **AIR-REPORT MESSAGES**

The Items of an air-report shall be reported in the order in which they are listed in the model AIREP SPECIAL form.
Form to be completed:

AIREP [SPECIAL]		
ITEM	PARAMETER	RT TRANSMISSION
	MESSAGE TYPE DESIGNATOR	[AIRREP] SPECIAL
1	AIRCRAFT IDENTIFICATION	AIRCRAFT ID
2	POSITION	POSITION (latitude and longitude) OVER (significant point) ABEAM (significant point) (significant point) (bearing) (distance)
3	Time	time
4	Level	FLIGHT LEVEL (number) or (number) METRES or FEET CLIMBING TO FLIGHT LEVEL (number) or (number) METRES or FEET DESCENDING TO FLIGHT LEVEL (number) or (number) METRES or FEET

5	Next position and estimated time over	(position) (time)
6	Ensuing significant point	(position)
7	Estimated time of arrival	(aerodrome) (time)
8	Endurance	ENDURANCE (hours and minutes)
9	Phenomenon encountered or observed, prompting a special air-report:	
	Moderate turbulence	TURBULENCE MODERATE
	• Severe turbulence	TURBULENCE SEVERE
	Moderate icing	ICING MODERATE
	• Severe icing	ICING SEVERE
	• Severe mountain wave	MOUNTAINWAVE SEVERE
	• Thunderstorms without hail	THUNDERSTORMS
	• Thunderstorms with hail	THUNDERSTORMS WITH HAIL
	• Heavy dust/sandstorm	DUSTSTORM or SANDSTORM HEAVY
	• Volcanic ash cloud	VOLCANIC ASH CLOUD
	• Pre-eruption volcanic activity or volcanic eruption	PRE-ERUPTION VOLCANIC ACTIVITY or VOLCANIC ERUPTION
	• Runway breaking action encounter is not as good as reported.	

Air-reports are also critically important in assessing the hazards which volcanic ash cloud presents to aircraft operations. These reports will reflect post flight reporting.

VOLCANIC AVTIVITY REPORT						
OPERATOR:				A/C IDENTIFICATION: (as indicated on flight plan)		
PILOT-IN-COMMAND:						
DEP FROM:	DATE:	TIME; UTC:	ARR AT:	DATE:	TIME; UTC:	
ADDRESSEE						
Items 1–8 are to be reported immediately to the ATS unit that you are in contact with.						
1) AIRCRAFT IDENTIFICATION				2) POSITION		
3) TIME				4) FLIGHT LEVEL OR ALTITUDE		
5) VOLCANIC ACTIVITY OBSERVED AT (position or bearing, estimated level of ash cloud and distance from aircraft)						
6) AIR TEMPERATURE				7) SPOT WIND		
8) SUPPLEMENTARY INFORMATION				Other_		
SO2 detected Yes No						
Ash encountered Yes No						
(Brief description of activity especially vertical and lateral						

extent of ash cloud and, where possible, horizontal movement, rate of growth, etc.)
After landing complete items 9–16 then fax form to: (Fax number to be provided by the meteorological authority based on local arrangements between the meteorological authority and the operator concerned.)
9) DENSITY OF ASH CLOUD (a) Wispy (b) Moderate dense (c) Very dense
10) COLOUR OF ASH CLOUD (a) White (b) Light grey (c) Dark grey (d) Black (e) Other _____
11) ERUPTION (a) Continuous (b) Intermittent (c) Not visible
12) POSITION OF ACTIVITY (a) Summit (b) Side (c) Single (d) Multiple (e) Not observed
13) OTHER OBSERVED (a) Lightning (b) Glow (c) Large rocks FEATURES OF ERUPTION (d) Ash fallout (e) Mushroom cloud (f) All
14) EFFECT ON AIRCRAFT (a) Communication (b) Navigation systems (c) Engines (d) Pitot static (e) Windscreen (f) Windows
15) OTHER EFFECTS (a) Turbulence (b) St. Elmo's Fire (c) Other fumes
16) OTHER INFORMATION Note – Pre-eruption volcanic activity in this co means unusual and/or increasing volcanic acti which could presage a volcanic eruption.

Forwarding of meteorological information
When receiving special air-reports, by voice communication air traffic services units shall forward these air-reports without delay to the associated meteorological watch offices, with the exception of conditions applying to runway breaking action encountered.

Forwarding of braking action information
When receiving special air reports by voice communications concerning braking action encountered that is not as good as that reported, air traffic services units shall forward them without delay to the appropriate aerodrome operator.

Section 2 Air Traffic Services

Chapter 12 Diversion Procedures

1 Introduction

1.1 Aircraft may divert from their planned destination to another aerodrome on the initiative of the pilot or on request from the appropriate authority on the ground. Diversions will normally be made for the following reasons:-

a) When the weather at the planned destination is reported to be below the minima prescribed by an operating company for their aircraft.

b) When obstructions on the landing area, which constitute a hazard to an aircraft landing, cannot be cleared within a reasonable period.

c) The failure of airborne equipment.

d) The failure of essential ground aids for ensuring a safe landing.

e) Unacceptable delay due to congestion of air traffic.

f) The closure of the aerodrome of destination due to aerodrome unservicability.

2 Types of Diversion

2.1 **Diversions Originated By the Pilot-In-Command of an Aircraft**

2.1.1 The pilot-in-command of an aircraft is primarily responsible for safety; therefore it is the pilot-in-command who will normally decide whether or not a safe landing can be effected at a given aerodrome. The pilot-in-command will normally be aware of the weather conditions at the planned destination and alternate aerodromes, therefore whenever a diversion is necessary; the pilot-in-command will make the intention known to Air Traffic Control and request further instructions. The decision to divert will normally be in accordance with the minima prescribed by the airline or operating company.

2.2 **Diversions Originated By the Ground Organisation**

2.2.1 When the controller concerned, or a company's representative on the ground considers it advisable for an aircraft to divert, they will consult together and agree on the reasons for the diversion and the aerodrome to which the aircraft should be diverted. The controller will then inform the pilot-in-command of the aircraft of the situation, giving the reasons for the suggested diversion, the necessary air traffic control clearance and any further information deemed necessary for the safe conduct of the flight.

3 Choice of Diversion Aerodromes

3.1 When a diversion becomes necessary, a diversionary aerodrome shall be selected taking the following factors into consideration:-

a) Pilot's preference, normally the alternate aerodrome specified in the flight plan;

b) Suitability of the airfield for the type of aircraft being diverted;

c) Weather at alternates and en-route;

d) Aircraft's endurance in relation to distance to the alternate aerodrome;

e) Serviceability of airfield and Navaids at the alternate aerodrome;

f) Custom and Immigration arrangements where applicable;

g) Availability of suitable fuel and ground handling facilities for the type of aircraft being diverted; and

h) Availability of hotel accommodation in case of an overnight stop.

4 Detailed Diversion Procedures

4.1 The need for an aircraft to be diverted may arise either when it is under the control of an ACC or Aerodrome/Approach Control at the aerodrome of destination. Furthermore, it may be necessary to arrange a diversion to either an aerodrome within the FIR or to an aerodrome in another FIR. It is essential therefore, when marginal weather conditions exist, for controllers to maintain a close watch on the weather conditions existing and the forecast at a possible diversion aerodrome, so that they are in a position to offer assistance to pilots and company representatives should the need for a diversion arise.

4.2 When it appears to the controller that due to weather or a possible change in airfield serviceability, it may be necessary for an aircraft to divert, the following actions are to be taken:-

a) Inform the pilot of the aircraft of the possibility that it may be necessary for him to divert;

b) Consult with the SAWS regarding the actual and forecast weather at the aerodrome of intended landing and at the available alternate/ diversion aerodromes, including the weather en- route. Where available, obtain actual weather conditions from airborne aircraft in the vicinity of the route to be followed;

c) Study the latest NOTAM of serviceability of aerodrome, radio aids and other facilities from all available diversion aerodromes;

d) Inform the local company representative of the possibility of a diversion and consult as to whether there is a choice of diversion aerodromes;

e) Inform the pilot to which aerodrome the diversion will be made if it becomes necessary. In order for the pilot to plan the diversion route in advance; provide adequate information on the condition of the diversion aerodrome and its associated communications, navigation and landing aids and any other information which will be of assistance.

f) Inform the controller at the diversion aerodrome of the possibility that the aircraft may be diverted there, giving full flight plan information.

g) If the diversion aerodrome is not open or is due to close shortly, ATC must arrange for the aerodrome to re-open or to remain open as the case may be.

4.3 When the aircraft diverts, the following actions shall be taken by the controller:

a) Ensure that a Change (CHG) message has been transmitted;

b) Transmit to the aircraft the latest weather information, ATC clearance, radio frequency to be used, etc;

c) Inform the controller at the diversion aerodrome that the aircraft has been diverted;

d) Inform the company representative that the aircraft has been diverted;

e) Inform those addressees on the departure message who are still concerned with the flight that the aircraft has been diverted.

4.4 In the case of an extreme emergency it may be necessary for an aircraft to be diverted without prior consultation with the company representative on the ground. In this event, the controller will pass the following message to the pilot-in-command and inform the company representative of the action taken and the reasons as early as possible. The message shall be transmitted via R/T in the following format:-

"*REQUEST DIVERT TO..... (Aerodrome), WEATHER AT (Diversion Aerodrome)……. (Reason for diversion)..... (Clearance instructions) .....ACKNOWLEDGE."*

4.5 The pilot-in-command shall acknowledge and comply with the advice given, or if unable to do so, will give the reasons for non-compliance and an alternative decision made.

Section 2 Air Traffic Services

Chapter 13 Meteorological Liaison Procedures

1 Introduction

1.1 Before the commencement of a shift and the taking-over of a control position, ATMSD personnel shall ensure that they have either studied the weather reports and forecasts supplied by SAWS, or have received a briefing by the local SAWS related to their area of responsibility and for the duration of the shift.

2 Supply of Meteorological Information

2.1 The SAWS supplies the responsible ANSP with relevant meteorological information. These meteorological observations are the official observations and as a general rule shall be the only information transmitted to aircraft. The exceptions are:

a) Indicated wind direction and speed;

b) RVR observations;

c) Sudden or unexpected deterioration of weather which, in the interests of safety, a controller considers it advisable to warn aircraft and consult with the SAWS afterwards;

d) Information from an aircraft in flight may be passed to other aircraft when a controller considers that it may be useful to them. When this is done, it shall be stated that the information originated from an aircraft in flight and the time at which the observation was made. Aircraft reports of meteorological conditions which could affect safety should always be passed on to other aircraft likely to be affected;

e) Conflicting or supplementary reports, as observed by controllers, which may affect aircraft operations, may be given to aircraft however it must be made quite clear that the reports are unofficial passed on for information purposes;

2.2 ATMSD personnel shall keep a close watch on the weather and report any sudden or unexpected deterioration's observed or obtained from pilots to the SAWS without delay. ATMSD personnel may be asked to obtain weather observations from aircraft.

2.3 Verification of Meteorological Information

2.3.1 If time allows, current weather reports should be compared with previous reports and the prevailing conditions. Differences which are difficult to reconcile with observed conditions, or barometric pressures which are not consistent with the apparent tendency should be confirmed with the SAWS before transmission to aircraft.

3 Transmission of Meteorological Information to Aircraft in Flight

3.1 General

3.1.1 All routine (METAR) and special (SPECI) reports are supplied to ATSUs in the Meteorological Aviation codes in accordance with ICAO standards.

3.1.2 Contents of meteorological reports and the order of elements in METAR and SPECI reports issued by the SAWS should contain the following information, as necessary, and normally in the following order:

a) Identification of type of information which follows;

b) Time group;

c) Identification of location;

d) Wind;

e) Visibility;

f) Runway visual range, when applicable;

g) Present weather;

h) Cloud;

i) Air temperature;

j) Dew point;

k) Pressure values;

l) Other significant information.

Note: *The names of only the elements in e, f, i, j and k should be included in the message using, in the case of pressure values, the appropriate Q code, either QNH or QFE. Refer to AIC 43.1*

3.1.3 Transmission of meteorological information to aircraft in flight will be done by the ATSU on a published ATC frequency on:

a) A request/ reply basis;

b) By ground initiative, by means of message directed to the aircraft concerned, in respect of SIGMET reports, SPECI and amended aerodrome forecasts;

c) ATSUs will pass the latest available weather at the destination aerodrome to all inbound aircraft when they establish contact at the FIR boundary;

d) When, in the opinion of the ATC, such reports will be useful for the safe and efficient conduct of the flight.

3.2 Meteorological Information Request/Reply Procedures

3.2.1 An ATSU receiving information from an aircraft for meteorological information, will request the SAWS to provide the information required, if it is not already to hand, and transmit the information to the aircraft with the minimum of delay. ATSUs should endeavour to anticipate aircraft requests for meteorological information so as to have information available when the aircraft calls.

3.2.2 The practice by flight crews to obtain weather reports via the controlling frequency should be discouraged. Flight crews should obtain pre-flight weather information from the SAWS prior to departure as part of the pre-flight briefing process, except in the case where a diversion of the flight is imminent.

3.2.3 When an aircraft departs shortly after a SIGMET, Selected Special Report or Amended Aerodrome Forecast which may affect the flight has been received by the ATSU, the ATMSD personnel shall verify as to whether or not the pilot received the report/ forecast during the pre-flight briefing. If the pilot has not already received the report/forecast the ATMSD personnel shall transmit the information on the designated frequency.

4 Automatic Terminal Information Service (ATIS) Broadcasts

4.1 Voice-ATIS Broadcast

4.1.1 Voice-ATIS shall be provided at aerodromes where it is required to reduce the communication load on ATS VHF frequencies. When provided they shall comprise:

a) One broadcast serving either arriving or departing aircraft or both, or

b) Two broadcasts serving arriving or departing aircraft respectively where the length of a single broadcast to serve both will be too long.

4.1.2 A discreet VHF frequency shall be used for voice-ATIS broadcasts. If a discrete frequency is not available, the transmission may be made on the voice channel(s) of the most appropriate terminal navigation aid(s), preferably a VOR, but not an ILS, provided the range and readability are adequate and the identification of the navigation aid is sequenced with the broadcast so that the latter is not obliterated.

4.1.3 Voice-ATIS broadcasts shall be continuous and repetitive.

4.1.4 Where the Voice-ATIS message was not prepared by the ATSU, the information contained in the message shall be made available immediately to the unit providing terminal and aerodrome services.

4.1.5 ATIS broadcasts shall be available in English; where more that one language is available each language shall be on a separate channel.

4.1.6 ATIS broadcast should ideally not exceed 30 (Thirty) seconds and care should be taken to keep the broadcast at a reasonable rate of speech.

4.1.7 Where ATIS broadcasts are available, any requests from a VOR equipped aircraft for terminal weather on VHF channels should be referred to the ATIS broadcasts in order to avoid unnecessary prolonged transmissions on VHF channels. Despite the fact that transition level and QNH is transmitted on the ATIS, this information shall again be transmitted on the approach frequency.

4.1.8 Pilots shall be informed when the runway is wet, even after light showers.

4.2 Data link ATIS (D-ATIS) Broadcast

4.2.1 Where D-ATIS supplements voice-ATIS, the information on both systems shall be the same and updated simultaneously.

4.2.2 Where real-time meteorological information is included but the data remains within the parameters of the significant change criteria, the content, for the purpose of maintaining the same designator, shall be considered identical.

Note: *Significant change criteria are specified in ICAO Annex 3, paragraph 4.3.4.*

4.3 Criteria For Voice-ATIS And/ or D-ATIS

4.3.1 Whenever Voice-ATIS and/or D-ATIS is provided:

a) The information shall relate to a single aerodrome;

b) The information shall be updated immediately when a significant change occurs;

c) The preparation and dissemination of the ATIS message shall be the responsibility of the ATSU;

d) Individual ATIS messages shall be identified by a designator in the form of a letter of the ICAO spelling alphabet. Designators for consecutive ATIS messages shall be in alphabetical order;

e) Arriving aircraft shall acknowledge receipt of the information upon establishing communication with the ATSU providing the approach control service or the aerodrome control tower, as appropriate;

f) The appropriate ATSU shall, when replying to the message in e) above or, provide the aircraft with the current altimeter setting; and

g) The meteorological information shall be extracted from the local meteorological routine or special report.

4.3.2 ATIS for arriving and departing aircraft should be kept as brief as possible and information already included in the SA- AIP or NOTAMs should only be included in exceptional circumstance. ATIS messages shall contain the following information:

a) Name of aerodrome;

b) Arrival or departure indicator where separate arrival and departure ATIS exist;

c) Contract type, if communication is via D-ATIS;

d) Designator;

e) Time of observation, if appropriate;

f) Type of approach (es) to be expected (only for arrival ATIS);

g) The runway(s) in use; status of arresting system constituting a potential hazard, if any;

h) Significant runway surface conditions and, if appropriate, braking action;

i) Holding delay, if appropriate;

j) Transition level;

k) Other essential operational information;

l) Surface wind direction (in degrees magnetic) and speed, including significant variations and, if surface wind sensors related specifically to the sections of runway(s) in use are available and the information is required by operators, the indication of the runway and the section of the runway to which the information refers;

m) Visibility and, when applicable, RVR; and, if visibility/RVR sensors related specifically to the sections of runway(s) in use are available and the information is required by operators, the indication of the runway and the section of the runway to which the information refers;

n) Present weather;

o) Cloud below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility when available;

p) Air temperature;

q) Dew point temperature;

r) Altimeter setting(s);

s) Any available information on significant meteorological phenomena in the approach (for arrival ATIS) and climb-out areas (for departure ATIS) including wind shear, and information on recent weather of operational significance;

t) Trend forecast, when available; and

u) Specific ATIS instructions.

Note: *Items in m), n) and o) above are replaced when conditions are CAVOK.*

Section 2 Air Traffic Services

Chapter 14 Holding Aircraft in Flight

1 Introduction

1.1 In the event of extended delays, aircraft should be advised of the anticipated delay as early as possible and, when practicable, be instructed or given the option to reduce speed en route in order to absorb delay.

1.2 When delays are expected, the ACC shall normally be responsible for clearing the aircraft to the holding point, and for including holding instructions, and expected approach time or onward clearance time, as applicable, in such clearances.

2 Onward clearance time (OCT)

2.1 In the event an aircraft is held en route or at a location or aid other than the initial approach fix, the aircraft concerned shall, as soon as practicable, be given an expected onward clearance time from the holding point. The aircraft shall also be advised if further holding at subsequent holding points is expected.

Note1: *"Onward clearance time" is the time at which an aircraft can expect to leave the point at which it is being held.*

2.2 When an aircraft is to be instructed to hold en-route or at a location or aid other than the initial approach fix it shall be given an OCT to leave the holding fix. This time will be calculated on the aircraft's estimate for the en-route holding facility plus a minimum of fifteen (15) minutes when it is not possible to make an accurate calculation immediately. Once it becomes possible for ATC to work out a more accurate OCT this time shall be updated accordingly.

2.3 The OCT shall be passed to the aircraft as an actual time using the following phraseology:

'Expected onward clearance time 1233'.

2.4 Approach control shall, as far as practical, supply an area control unit with ten (10) minutes prior notification when holding is required.

3 Holding Procedures

3.1 Holding and holding pattern entry shall be accomplished in accordance with procedures established by the SA-CAA and published in the SA-AIP. If entry and holding procedures have not been published or if the procedures are not known to a flight crew, the appropriate air traffic control unit shall specify:

a) The designator of the location or aid to be used;

b) The inbound track, radial or bearing;

c) Direction of turn in the holding pattern as well as the time of the outbound leg or the distances between which to hold.

3.2 Aircraft should normally be held at a designated holding point. The required minimum vertical, lateral or longitudinal separation from other aircraft shall be provided. Criteria and procedures for the simultaneous use of adjacent holding patterns shall be prescribed in local instructions.

Note: *See Section 6, Chapter 4, Paragraph 17 "Holding Aircraft", concerning separation of aircraft holding in flight.*

3.3 Levels at holding points shall as far as practicable be assigned in a manner that will facilitate clearing each aircraft to approach in its proper priority. Normally, the first aircraft to arrive over a holding point should be at the lowest level, with following aircraft at successively higher levels.

3.4 When extended holding is anticipated, turbojet aircraft should, when practicable, be permitted to hold at higher levels in order to conserve fuel, whilst retaining their order in the approach sequence.

3.5 If an aircraft is unable to comply with the published or cleared holding procedure, alternative instructions shall be issued.

3.6 Holding at Facilities for Which Procedures Have Not Been Published

3.6.1 For the purpose of maintaining a safe and orderly flow of traffic, an aircraft may be instructed to hold at its present or at any other position, provided the required obstacle clearance is ensured.

3.6.2 When a controller requires an aircraft to hold at a holding point for which a procedure has not been published, the controller shall specify the procedure to be flown as per paragraph 3.1.

4 Expected Approach Time (EAT)

4.1 Approach control will be responsible for computing EAT where necessary for arriving aircraft within its CTR and/or TMA. Such EATs will be passed to area control for re-transmission to the aircraft as soon as practicable and preferably not later than at the commencement of its initial descent from cruising level. Whilst under approach control the aircraft shall be given updated EATs, where there is a variance of more than three (3) minutes, without delay. Area control will only be given revisions in EAT when the change is more than five (5) minutes. Approach shall compute the EAT by adding the specified approach time interval as stipulated in the SSI Manual between approaches to the last EAT allocated to an arriving aircraft. The time interval between approaches specified in the SSI Manual will allow for the first aircraft to complete its intermediate approach, procedure turn (or base turn) as specified and to have passed the holding facility on final before the next aircraft commences descent from the initial approach altitude. If the weather conditions are such that the pilot may experience difficulty in effecting a landing this time interval should be increased sufficiently to allow the first aircraft to land before the second one commences its descent from the initial approach altitude.

Note: *An EAT (or OCT) is not authority for an aircraft to commence approach (or resume its flight), hence aircraft which have been given an EAT (or OCT) must be given a clearance by ATC to commence approach (or resume its flight) at or before the time the EAT (or OCT) is reached. Only in the event of a radio failure will be pilot commence his approach (or resume his flight) at EAT (or OCT) without clearance to do so.*

4.2 The EAT shall be passed to the aircraft as an actual time using the following phraseology:

'Expected Approach Time 1018'

4.3 If for reasons other than weather, i.e. obstructions on the runway, the delay cannot be determined, no EAT is to be given. The aircraft is to be informed, '*Delay not determined*' and the reason is to be given.

5 Holding for Weather Improvement

5.1 Pilots of arriving aircraft may elect to hold for the weather to improve. In addition to passing routine weather reports, controllers are to advise pilots of other relevant meteorological information.

5.2 The first aircraft to enter the holding pattern is to be advised, 'no traffic delay expected'. No instruction to leave the holding facility shall be given until the pilot indicates his intention to attempt a landing.

5.3 Subsequent aircraft entering the holding pattern shall be advised *'Delay not determined. (Number) aircraft holding for weather improvement'.* Controllers should establish the intention of any pilot if it has not already been stated.

5.4 When a pilot wishes to make an approach he is to be given routing instructions to enable him to descend clear of other traffic and return to the holding facility above other aircraft which have elected to make an approach. He is to be given an expected approach time relative to those aircraft and will take his place in the normal landing sequence.

5.5 If aircraft are making approaches in poor weather conditions the possibility of missed approaches shall be considered. The lowest holding level at a convenient holding facility shall normally be kept vacant for such eventualities.

6 Visual Holding Points

6.1 After coordination with the approach control unit, the ACC may clear arriving aircraft to visual holding points to hold until further advised by the approach control unit.

6.2 After coordination with the aerodrome control tower, the approach control unit may clear arriving aircraft to visual holding points to hold until further advised by the aerodrome control tower.

Section 2 Air Traffic Services

Chapter 15 VHF Direction Finding

1 Introduction

1.1 South African VDF stations normally operate independently to provide a homing service to aircraft as published in the SA-AIP. The information provided by A VDF station is an approximate bearing/ heading, however a VDF is not a primary navigational aid.

1.2 The use of VDF in respect of ATS is a tool to increase situational awareness as to the location of aircraft in the vicinity of the VDF station. Information from the VDF can also be used to assist pilots who have strayed and permits ATMSD personnel to provide advice on homing towards the VDF station however this does not take the prevailing wind factors into consideration.

2 Information Provided by a VDF Station

2.1 VDF stations working independently shall provide the following information as required:

a) Magnetic bearing of the aircraft from the station, using the code QDR, or the phrase:

"*Your magnetic bearing from me is ... degrees."*

b) Magnetic heading to steer, with no wind, to head for the VDF station, using the code QDM or the phrase,

'The suggested magnetic heading for you to steer to reach me with zero wind is ... degrees".

3 Classification of VDF Equipment

3.1 According to ICAO Doc. 9426, ATS Planning Manual, Chapter 6, *III*-1-6-1,bearings shall be classified as follows:

a) Class A - Accurate within plus minus 2 degrees;

b) Class B - Accurate within plus minus 5 degrees; or

c) Class C - Accurate within plus minus 10 degrees.

3.2 The class of the bearing shall normally be passed to the aircraft at the same time as the bearing, except that when a series of headings is being given to home the aircraft to the VDF station.

Section 2 Air Traffic Services

Chapter 16 Handover Procedure

1 Introduction

1.1 Before vacating an operating position for any reason while a unit is still in operation, ATMSD personnel vacating that position should ensure that there is a clear understanding as to who will assume responsibility for that particular operating position and an appropriate hand-over should be effected.

1.2 It is essential that all ATMSD personnel occupying an operating position are in a satisfactory state of health throughout their period of duty. Accordingly, ATMSD personnel should not assume or retain responsibility for any ATS operating position if his capacity to perform the duties of the position is in any way impaired because of sickness, injury, alcohol, drugs, fatigue, personal worry or emotional state. ATMSD personnel who consider that their physical or emotional state is such that their ability to perform duties satisfactorily may be impaired should notify ATSU management and that necessary relief arrangements are made.

2 Procedures Prior to Handover

2.1 Prior to taking over an operating position, ATMSD personnel should:

a) Ensure that they has a full understanding of the air traffic situation including an awareness of clearances issued but not yet acted upon and any developing situation requiring early attention;

b) Familiarise themselves with the serviceability of all equipment liable to be used during the duration of the shift (e.g. radar, radio, approach aids, telephone lines and aerodrome lighting);

c) Obtain all relevant information and familiarise themselves with the meteorological situation and trends for the duration of the shift and where practicable get a personal briefing from the SAWS;

d) Ensure that they are fully conversant with the latest operational instructions, notices and information, particularly with reference to the serviceability of aerodromes and other air navigation facilities;

e) Sign-on in the occurrence log at the operating position, as applicable, as having accepted responsibility for the position.

3 Procedures for Handing Over an Operational Position

3.1 ATMSD personnel handing over an operational position to another person shall ensure that the successor is provided with full information on the current traffic situation and any matters of significance which have influenced the development of the situation or which may have a bearing on the situation arising during the course of the shift.

3.2 When a prevailing traffic situation or other events makes it desirable for ATMSD personnel to complete all actions before transferring responsibility to another person, they should remain on duty until such time as these actions have been completed.

3.3 However, assembly of records or completion of reports associated with any such event should be completed after hand-over is effected but before signing off. In any case it must be ensured that responsibility for manning a position is recorded in an uninterrupted manner.

3.4 **Considerations before a Position Hand-over:**

3.4.1 A hand-over produces a workload of its own. Careful consideration to the timing should be given;

3.4.2 If it is likely that the sector will be split shortly after the hand-over consider splitting it before the hand-over;

3.4.3 Simultaneous take-over of all the sector positions (for example both radar and planner) should be avoided;

3.4.4 Do not short cut the existing good practices during low vigilance periods;

3.4.5 The handing-over controller should tidy up the working position prior to the hand-over.

3.5 **Considerations during a Position Hand-over:**

3.5.1 Avoid distracting controllers during hand-over;

3.5.2 Use checklists with the sequence of actions to be performed by both handing-over and taking-over controllers;

3.5.3 The taking-over controller should ensure that he/she has been able to assimilate all information relevant to a safe hand-over and should accept responsibility only after he/she is completely satisfied that he/she has a total awareness of the situation;

3.5.4 Use mnemonic reminders within the checklist like "check REST" before going to rest:

		Examples
R	**Restrictions**	*Flow restrictions, FUA, Danger, Prohibited and other special status airspace.*
E	**Equipment**	*Status, maintenance, ground/ ground communications, air-ground communications, navigation, surveillance, radar filters, radar source, type of surveillance sources integration if multiple, strip printers, workstations, information systems.*
S	**Situation**	*Weather (fog, snow, hail, visibility, low/high pressure, thunderstorm activity, turbulence, CAT, winds etc.), Staffing, Configurations (Sectors, Runways, Taxiways, Adjacent sectors etc.), Strips, Holding.*
T	**Traffic**	*All under control, expected, military, VIP, Aerial activity, non-compliant with ATM regulations, VFR flights, Clearances and instructions given.*

3.6 **Considerations after a Hand-over:**

3.6.1 The handing-over controller should remain available for few minutes following the handover, particularly in dynamic traffic situations, to provide clarifications/assistance regarding any points which may subsequently arise;

3.6.2 Other controllers on the sector should only impart additional information after a hand-over is complete.

Section 2 Air Traffic Services

Chapter 17 Co-ordination Procedures

1 General

1.1 The coordination and transfer of control of a flight between successive ATC units and control sectors shall be effected by a process comprising the following stages:

a) Notification of the flight in order to prepare for coordination, as necessary;

b) Coordination of conditions of transfer of control by the transferring ATC unit;

c) Coordination, if necessary, and acceptance of conditions of transfer of control by the accepting ATC unit; and

d) The transfer of control to the accepting ATC unit or control sector.

1.2 ATSUs should, to the extent possible, establish and apply standardised procedures for the coordination and transfer of control of flights, in order, *inter alia*, to reduce the need for verbal coordination. Such coordination procedures shall conform to the procedures contained in the letters of agreement and SSI Manual.

1.3 Such agreements and instructions shall cover the following as applicable:

a) Definition of areas of responsibility and common interest, airspace structure and airspace classification (s);

b) Any delegation of responsibility for the provision of ATS;

c) Procedures for the exchange of flight plan and control data, including use of automated and/or verbal coordination messages;

d) Means of communication;

e) Requirements and procedures for approval requests;

f) Significant points, levels or times for transfer of control;

g) Significant points, levels or times for transfer of communication;

h) Conditions applicable to the transfer and acceptance of control, such as specified altitudes/flight levels, specific separation minima or spacing to be established at the time of transfer, and the use of automation;

i) ATS Surveillance coordination procedures;

j) SSR Code assignment procedures;

k) Procedures for departing traffic;

l) Designated holding fixes and procedures for arriving traffic;

m) Applicable contingency procedures; and

n) Any other provisions or information relevant to the coordination and transfer of control of flights.

2 Point-out Procedure

2.1 This is an action taken by a controller to coordinate the radar identification of an aircraft with another controller, when radio communication may not be transferred.

2.2 A point-out may be used to coordinate the flight data and radio communication of an aircraft that will or may enter the area of jurisdiction of another controller and approval is sought not to transfer communication to that controller.

2.3 The requesting controller shall initiate the co-ordination by stating "*POINT-OUT REQUEST".* The requesting controller shall pass all relevant flight data to the approving controller.

2.4 The Approving controller shall ensure that the position of the aircraft corresponds with the information as passed to them. After considering the traffic situation and the need to maintain radio communication with the aircraft the approving controller shall reply:

a) "*POINT-OUT APPROVED* [*callsign*]": in which case the requesting controller may retain communication with the aircraft while the aircraft is transiting the sector of the approving controller OR

b) "*NEGATIVE POINT-OUT* [*callsign*]": in which case the aircraft shall be transferred to the approving controller at the appropriate time.

2.5 The approving controller may specify restrictions to be complied with before any changes to the aircraft's flight path, level or radar tag information is made, by the requesting controller, from that which was co-ordinated, it shall be re-coordinated with the approving controller.

2.6 Where the possibility exist that conflict may arise with other traffic, radio communication shall be transferred.

2.7 Aircraft should not be allowed to transit through or operate in a sector for an extended period of time without radio communication with the controller that has jurisdiction over the sector.

3. Coordination of activities potentially hazardous to civil aircraft

3.1 An ANSP shall ensure that a safety risk assessment is conducted, as soon as practicable, for activities potentially hazardous to civil aircraft and that appropriate risk mitigation measures are implemented.

Note — Such risk mitigation measures may include, but would not be limited to, airspace restriction or temporary withdrawal of established ATS routes or portions thereof.

3.2 An ANSP on receipt of information indicating activities potentially hazardous to civil aircraft shall:

(a) implement measures to ensure safety of aircraft potentially affected by such hazard,

(b) ensure that the operators/entities potentially affected by such hazards are informed timeously; and

(c) inform the relevant Authority of actions.

3.3 An organisation or unit conducting or identifying activities potentially hazardous to civil aircraft shall contribute to the safety risk assessment in order to facilitate consideration of all relevant safety significant factors, as per the procedures established by the Authority.

Chapter 18 Performance-Based Communications and Surveillance (PBCS)

1. Required Communications Performance (RCP) and Required Surveillance Performance (RSP) specifications

1.1 The ANSP shall ensure that the communication and surveillance capabilities of its ATM system comply with RCP 240 and RSP 180 specifications.