KURDISTAN REGIONAL GOVERNMENT

SULAYMANIYAH INTERNATIONAL AIRPORT

MATS

CHAPTER 15

APPROACH CONTROL

(First Edition)

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15.1 FUNCTIONS OF APPROACH CONTROL

15.1.1 General

15.1.1.1 Approach Control shall issue information and clearances to achieve a Safe, orderly and expeditious flow of air traffic within their area of responsibility with the objective of preventing collisions between aircraft.

15.1.2 Provisions of Service

15.1.2.1 Approach Control shall be responsible for providing:-

a. Approach Control Service.

b. Flight Information Service.

c. Alerting Service.

15.1.3 Responsibilities

15.1.3.1 Approach control is responsible for providing an approach control service to:-

a. All aircraft operating in, entering or leaving the approach control area of responsibility.

b. All aircraft which have been transferred from area control and accepted by approach control until they have:-

i. been transferred back to area control, or

ii. been accepted by aerodrome control, or landed or

iii. left controlled airspace.

c. All aircraft which have been transferred by aerodrome control and have been accepted by approach control until they have:-

i. been transferred back to aerodrome control, or

ii. been transferred to area control, or

iii. left controlled airspace.

15.1 3.2 If there is a possibility of confliction between an en - route aircraft under area control and aircraft under approach control, the responsibility for control of the en-route aircraft may be delegated to approach control for the period that confliction is likely to occur. Control of overflying aircraft which have been released to approach control shall be transferred back to area control when they are no longer a factor to approach control.

15.1.3.3 Approach control may, according to circumstances, delegate all or part of its responsibilities for a particular flight to either aerodrome control or area control, as appropriate, provided that the procedure is so agreed beforehand and the controller accepting the delegated responsibility is appropriately qualified.

15.1.3.4 Approach control shall determine the permitted take – off time when necessary to separate traffic. However, when area control has already specified a restriction, the time determined by approach control shall not be earlier than the " RELEASE NOT BEFORE " nor later than the "CLEARANCE EXPIRES" time specified by area control.

15.1.3.5 During IMC not more than one IFR arrival at a time shall be transferred to aerodrome control unless 15.1.3.3 above, is complied with. Departures shall be subject to individual co-ordination with aerodrome control.

15.1.3.6 Approach control may clear VFR aircraft to such visual holding points as are specified by aerodrome control.

15.1.3.7 Approach control may specify that departing aircraft are released subject to the discretion of aerodrome control, in accordance with the provisions of Chapter 14 (aerodrome control service) Section 14.8.2.4.10 of this manual, in respect of arriving aircraft that have commenced approach for landing but are not yet released to aerodrome control.

15.1.3.8 Control of departing aircraft shall be transferred to area control at the earliest practical time but not before the time separation between the departing aircraft and arriving aircraft released to approach control has been effected.

15.1.3.9 Approach control is responsible for notifying aircraft under its control of any failure or irregularity of any apparatus, light or other device provided at an aerodrome for the guidance of aerodrome traffic.

15.1.4 Division Of Responsibility Between Approach Control And Aerodrome Control

Note 1. For local procedures at Sulaymaniyah International Airport, see Sulaymaniyah Local Operating Procedures (LOP) Chapter 7 and Appendix 9.

Note 2. See Chapter 14 (aerodrome control service) section 14.9.2 of this manual.

15.1.4.1 Arriving Aircraft: . Control of an arriving aircraft shall be transferred from the unit providing approach control service to the unit providing aerodrome control service when the aircraft:

Note. For local procedures at Sulaymaniyah International Airport, see Sulaymaniyah Local Operating Procedures (LOP) Chapter 7 and Appendix 9.

a. is in the vicinity of the aerodrome, and

i. it is considered that approach and landing will be completed in visual reference to the ground, or

ii. has reached uninterrupted VMC, or

b. is at a prescribed point or level, or

c. has landed;

as specified in letter of agreement or local instructions.

Note. Where a transfer of control is to be effected after an aircraft has landed, approach control shall obtain a landing clearance from aerodrome control prior to clearing an aircraft to land.

15.1.4.2 Departing Aircraft: . Control of a departing aircraft shall be transferred from the unit providing aerodrome control service to the unit providing approach control service:

Note. For local procedures at Sulaymaniyah International Airport, see Sulaymaniyah Local Operating Procedures (LOP) Chapter 7 and Appendix 9.

a. when visual meteorological conditions prevail in the vicinity of the aerodrome :

i. prior to the time the aircraft leaves the vicinity of the aerodrome, or

ii. prior to the time the aircraft enters IMC, or

iii. when the aircraft is at a prescribed point or level, as specified in letter of agreement or local instructions.

b. when instrument meteorological conditions prevail at the aerodrome:

i. immediately after the aircraft is airborne, or

ii. when the aircraft is at a prescribed point or level, as specified in letter of agreement or local instructions.

15.1.4.3 Control of certain flights may be transferred directly from an area control centre to an aerodrome control tower and vice-versa by prior arrangement between units concerned for the relevant part of approach control service to be provided by the area control centre or the aerodrome control tower, as applicable.

15.1.4.4 When approach control is combined with aerodrome control, they shall provide, in addition to the approach control service, those parts of the aerodrome control service which apply to arriving and departing aircraft.

15.1.4.5 Approach may delegate its function to aerodrome control with regard to any or all of the training aircraft operating in the vicinity of the aerodrome in IMC, provided that the aerodrome controller holds an approach control rating valid for that aerodrome.

15.1.5 DIVISION OF RESPONSIBILITY BETWEEN APPROACH AND AREA CONTROL UNITS

15.1.5.1 Responsibility for controlled flights shall rest with the ACC except that approach control shall be responsible for the control of:-

a. Arriving aircraft that have been released to him by the ACC

b. Departing aircraft until such aircraft are transferred to the ACC.

15.2 COORDINATION

15.2.1 COORDINATION BETWEEN A UNIT PROVIDING APPROACH CONTROL SERVICE AND A UNIT PROVIDING AREA CONTROL SERVICE

15.2.1.1 DIVISIONS OF CONTROL

15.2.1.1.1 Except when otherwise specified in letters of agreement or local instructions, or by the ACC concerned in individual cases, a unit providing approach control service may issue clearances to any aircraft released to it by an ACC without reference to the ACC, provided that approach control shall:-

a. neither clear an aircraft to a higher level than that specified in the release nor,

b. re-route released aircraft into areas that may conflict with traffic under the control of area control, unless co – ordination has been effected.

However, when an approach has been missed the ACC shall, if affected by the missed approach, be advised immediately and subsequent action coordinated between the ACC and the unit providing approach control service as necessary.

15.2.1.1.2 An ACC may, after coordination with the unit providing approach control service, release aircraft directly to aerodrome control tower if the entire approach will be made under visual meteorological conditions.

15.2.1.1.3 When weather conditions require an approach sequence, and after co-ordination with approach control, the ACC shall clear arriving aircraft to a specified holding point, including holding instructions and expected approach time in such clearance.

15.2.1.1.4 Approach control unit shall observe the co-ordination instructions issued by ACC.

15.2.1.2 TAKE-OFF AND CLEARANCE EXPIRY TIMES

15.2.1.2.1 Time of take-off shall be specified by the ACC when it is necessary to:

a. coordinate the departure with traffic not released to the unit providing approach control service; and

b. provide en – route separation between departing aircraft following the same route.

15.2.1.2.2 If time of take-off is not specified, the unit providing approach control service shall determine the take-off time when necessary to coordinate the departure with traffic released to it.

15.2.1.2.3 A clearance expiry time shall be specified by the ACC if a delayed departure would conflict with traffic not released to the unit providing approach control service. If, for traffic reasons of its own, a unit providing approach control service has to specify in addition its own clearance expiry time, this shall not be later than that specified by the ACC.

15.2.1.3 EXCHANGE OF MOVEMENT AND CONTROL DATA

15.2.1.3.1 The unit providing approach control service shall keep the ACC promptly advised of pertinent data on controlled traffic such as:

a. runway(s)-in-use and expected type of instrument approach procedure;

b. lowest vacant level at the holding fix available for use by the ACC;

c. average time interval or distance between successive arrivals as determined by the unit providing approach control service;

d. revision of the expected approach time issued by the ACC when the calculation of the expected approach time by the unit providing approach control service indicates a variation of five minutes or such other time as has been agreed between the two ATC units concerned;

Note. For local procedures at Sulaymaniyah International Airport 3 minutes shall be applied, see Sulaymaniyah Local Operating Procedures (LOP) Chapter 7 Section 7.3.8.3.2.

e. arrival times over the holding fix when these vary by three minutes, or such other time as has been agreed between the two ATC units concerned, from those previously estimated;

f. cancellations by aircraft of IFR flight, if these will affect levels at the holding fix or expected approach times of other aircraft;

g. aircraft departure times or, if agreed between the two ATC units concerned, the estimated time at the control area boundary or other specified point;

h. all available information relating to overdue or unreported aircraft;

i. missed approaches which may affect the ACC.

15.2.1.3.2 The ACC shall keep the unit providing approach control service promptly advised of pertinent data on controlled traffic such as:

a. identification, type and point of departure of arriving aircraft;

b. estimated time and proposed level of arriving aircraft over holding fix or other specified point;

c. actual time and proposed level of arriving aircraft over holding fix if aircraft is released to the unit providing approach control service after arrival over the holding fix;

d. requested type of IFR approach procedure if different to that specified by the approach control unit;

e. expected approach time issued;

f. when required, statement that aircraft has been instructed to contact the unit providing approach control service;

g. when required, statement that an aircraft has been released to the unit providing approach control service including, if necessary, the time and conditions of release;

h. anticipated delay to departing traffic due to congestion.

15.2.1.3.3 Information on arriving aircraft shall be forwarded not less than fifteen minutes before estimated time of arrival and such information shall be revised as necessary.

15.2.2 COORDINATION BETWEEN A UNIT PROVIDING APPROACH CONTROL SERVICE AND A UNIT PROVIDING AERODROME CONTROL SERVICE

Note. For local procedures at Sulaymaniyah International Airport, see Sulaymaniyah Local Operating Procedures (LOP) Chapter 7 and Appendix 9.

15.2.2.1 DIVISION OF CONTROL

15.2.2.1.1 After coordination with aerodrome control, approach control may clear arriving VFR flights to visual holding points to hold until further advised by aerodrome control.

15.2.2.1.2 A unit providing approach control service shall retain control of arriving aircraft until such aircraft have been transferred to the aerodrome control tower and are in communication with the aerodrome control tower. Except when otherwise prescribed in letters of agreement or local instructions, not more than one arrival shall be transferred to a unit providing aerodrome control service during IMC.

15.2.2.1.3 A unit providing approach control service may authorize an aerodrome control tower to release an aircraft for take-off subject to the discretion of the aerodrome control tower with respect to arriving aircraft.

15.2.2.1.4 Aerodrome control towers shall, when so prescribed in letters of agreement or local instructions, obtain approval from the unit providing approach control service prior to authorizing operation of special VFR flights.

15.2.2.2 EXCHANGE OF MOVEMENT AND CONTROL DATA

15.2.2.2.1 From Aerodrome Control To Approach Control : An aerodrome control tower shall keep the unit providing approach control service promptly advised of pertinent data on relevant controlled traffic such as:

a. arrival and departure times;

b. when required, statement that the first aircraft in an approach sequence is in communication with and is sighted by the aerodrome control tower, and that reasonable assurance exists that a landing can be accomplished;

c. all available information relating to overdue or unreported aircraft;

d. information concerning missed approaches;

e. information concerning aircraft that constitute essential local traffic to aircraft under the control of the unit providing approach control service.

15.2.2.2.2 From Approach Control to Aerodrome Control: The unit providing approach control service shall keep the Aerodrome control tower promptly advised of pertinent data on controlled traffic such as :

a. estimated time and proposed level of arriving aircraft over the aerodrome, at least fifteen minutes prior to estimated arrival;

b. when required, a statement that an aircraft has been instructed to contact the aerodrome control tower and that control shall be assumed by that unit;

c. anticipated delay to departing traffic due to congestion.

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Note. The transfer of control message shall contain the following elements in the order listed :-

1. The word "RELEASE";

2. The aircraft Callsign

3. Position on approach;

4.Type of approach;

5. Transfer point and RTF contact point if different;

*6. Other pertinent information***.**

15.3 CONTROL OF DEPARTING AIRCRAFT

15.3.1. GENERAL PROCEDURES

15.3.1.1 Departing traffic shall be given any or all of the following instructions:

a. direction of take-off;

c. turn after take-off;

c. SID to be followed ;

d. level to maintain before continuing climb to assigned cruising level;

e. time, point and/or rate at which level change shall be made;

f. transition level (if requested);

15.3.1.2 Commensurate with an orderly flow of air traffic, air traffic control units should attempt to permit aircraft departing on long distance flights to proceed on track with as few turns or other manoeuvers as possible, and to climb to cruising level without restrictions.

15.3.1.3 If departures have been delayed for any reason, they shall normally be cleared for departure in an order based on their estimated time of departure, except that deviation from this order may be made to facilitate the maximum number of departures with the least average delay.

15.3.1.4 Air traffic control units should advise aircraft operators or their designated representatives when anticipated delay due to traffic conditions are likely to be substantial and in any event when they are expected to exceed 30 minutes.

15.3.2 INFORMATION FOR DEPARTING AIRCRAFT

15.3.2.1 Information regarding significant changes in the meteorological conditions in the take - off or climb – out area, obtained by the unit providing approach control service after a departing aircraft has established communication with such unit, shall be transmitted to the aircraft without delay, except when it is known that the aircraft has already received the information.

Note. Significant changes in this context include those relating to surface wind direction or speed, visibility, runway visual range or air temperature (for turbine-engined aircraft), and the occurrence of thunderstorm or cumulonimbus, moderate or severe turbulence, wind shear, hail, moderate or severe icing, severe squall line, freezing precipitation, severe mountain waves, sandstorm, duststorm, blowing snow, tornado or waterspout.

15.3.2.2 Information regarding changes in the operational status of visual or non-visual aids essential for take-off and climb shall be transmitted without delay to a departing aircraft, except when it is known that the aircraft has already received the information.

15.3.2.3 In applying the provisions in 15.3.2.1 and 15.3.2.2 above, any and all elements of information contained in a current ATIS broadcast, the receipt of which has been acknowledged by the aircraft concerned, need not be included in transmissions to the aircraft.

15.3.2.4 Information regarding essential local traffic known to the controller shall be transmitted to departing aircraft without delay. Essential local traffic in this context consists of any aircraft in the take-off and climb-out area, which may constitute a collision hazard.

15.3.3 STANDARD CLEARANCES FOR DEPARTING AIRCRAFT

15.3.3.1 GENERAL

15.3.3.1.1 The appropriate ATS authority should, wherever possible, establish standardized procedures or transfer of control between the ATC units concerned, and standard clearances for departing aircraft.

15.3.3.2 COORDINATION

15.3.3.2.1 Where standard clearances for departing aircraft have been agreed to between the units concerned, the aerodrome control tower will normally issue the appropriate standard clearance without prior coordination with or approval from the approach control unit or ACC.

15.3.3.2.2 Prior coordination of clearances should be required only in the event that a variation to the standard clearance or the standardized transfer of control procedures is necessary or desirable for operational reasons.

15.3.3.2.3 Provision shall be made to ensure that the approach control unit at all times is kept informed of the sequence in which aircraft will depart as well as the runway to be used.

15.3.3.2.4 Provision shall be made to display the designators of assigned SIDs to the aerodrome control tower, the approach control unit and/or the ACC as applicable.

15.3.3.3 CONTENTS OF STANDARD CLEARANCE

15.3.3.3.1 Standard clearances for departing aircraft shall contain the following items:

a. aircraft identification;

b. clearance limit, normally destination aerodrome;

c. designator of the assigned SID, if applicable;

d. initial level, except when this element is included in the SID description;

e. allocated SSR code;

f. any other necessary instructions or information not contained in the SID description, e.g. instructions relating to change of frequency.

15.4 CONTROL OF ARRIVING AIRCRAFT

15.4.1 GENERAL PROCEDURES

15.4.1.1 When it becomes evident that delays will be encountered by arriving aircraft, operators or designated representatives shall, to the extent practicable, be notified and kept currently informed of any changes in such expected delays.

15.4.1.2 Arriving aircraft may be required to report when leaving or passing a significant point, or navigation aid, or when starting procedure turn or base turn, or to provide other information required by the controller, to expedite departing and arriving aircraft.

15.4.1.3 An IFR flight shall not be cleared for an initial approach below the appropriate minimum altitude nor to descend below that altitude unless:

a. the pilot has reported passing an appropriate point defined by a navigation aid or as a waypoint; or

b. the reports that the aerodrome is and can be maintained in sight;or

c. the aircraft is conducting a visual approach; or

d. the aircraft's position has been positively determined by the use of radar, and a lower minimum altitude has been specified for use when providing radar services.

15.4.1.4 At aerodromes where standard instrument arrivals (STARs) have been established, arriving aircraft should normally be cleared to follow the appropriate STAR. The aircraft shall be informed of the type of approach to expect and runway-in-use as early as possible.

Note. See Section 15.4.4 of this manual concerning Standard clearance for Arriving aircraft.

15.4.1.5 After coordination with the approach control unit, the ACC may clear the first arriving aircraft for approach rather than to a holding fix.

15.4.2. ALTIMETER SETTINGS

Note. See Chapter 9 (Altimetry and Meteorology) of this manual.

15.4.2.1 A QNH altimeter setting shall be included in approach clearances except when it is known that the aircraft has already received the information.

15.4.2.2 A QFE altimeter setting shall be provided on request.

15.4.2.3 Altimeter settings provided to aircraft on approach shall be rounded down to the nearest whole hPa.

15.4.3 CLEARANCE TO DESCEND SUBJECT TO MAINTAINING OWN SEPARATION WHILE IN VMC

Note. See Chapter 11(Separation) Section 11.9 of this manual.

15.4.3.1 When requested by the aircraft and if in case in the vicinity of the aerodrome, an arriving aircraft may be cleared to descend subject to maintaining own separation from conflicting traffic and remaining in VMC if reports indicate that this is possible. Essential traffic information should be transmitted to all aircraft concerned.

15.4.4 STANDARD CLEARANCES FOR ARRIVING AIRCRAFT

15.4.4.1 GENERAL

15.4.4.1.1 The appropriate ATS authority should, wherever possible, establish standardized procedures for transfer of control between the ATC units concerned and standard clearances for arriving aircraft.

15.4.4.2 COORDINATION

15.4.4.2.1 Where standard clearances for arriving aircraft are in use and, provided no terminal delay is expected, clearance to follow the appropriate STAR will normally be issued by the ACC without prior coordination with or approval from the approach control unit or the aerodrome control tower as applicable.

15.4.4.2.2 Prior coordination of clearances should be required only in the event that a variation to the standard clearance or the standardized transfer of control procedures is necessary or desirable for operational reasons.

15.4.4.2.3 Provision shall be made to ensure that the approach control unit is at all times kept informed of the sequence of aircraft following the same STAR.

15.4.4.2.4 Provision shall be made to display the designators of assigned STARs to the ACC, the approach control unit and/or the aerodrome control tower, as applicable.

15.4.4.3 CONTENTS

15.4.4.3.1 Standard clearances for arriving aircraft shall contain the following items:

a. aircraft identification;

b. designator of the assigned STAR;

c. runway-in-use, except when this element is included in the STAR description;

d. initial level, except when this element is included in the STAR description; and

e. any other necessary instructions or information not contained in the STAR description, e.g. change of communications.

15.4.5 VISUAL APPROACH

15.4.5.1 Subject to the conditions in 15.4.5.3 below, clearance for an IFR flight to execute a visual approach may be requested by a flight crew or initiated by the controller. In the latter case, the concurrence of the flight crew shall be required.

15.4.5.2 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 meteorological conditions when initiating visual approaches.

15.4.5.3 An IFR flight may be cleared to execute a visual approach provided the pilot can maintain visual reference to the terrain and:-

a. the reported ceiling is at or above the level of the beginning of the initial approach segment for the aircraft so cleared; or

b. 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.

c. at night, has the airfield in sight.

15.4.5.4 Separation shall be provided between an aircraft cleared to execute a visual approach and other arriving and departing aircraft.

15.4.5.5 For successive visual approaches, separation shall be maintained by the controller until the pilot of a succeeding aircraft reports having the preceding aircraft in sight. The aircraft shall then be instructed to follow and maintain own separation from the preceding aircraft. When both aircraft are of a heavy wake turbulence category, or the preceding aircraft is of a heavier wake turbulence category than the following, and the distance between the aircraft is less than the appropriate wake turbulence minimum, the controller shall issue a caution of possible wake turbulence. The pilot-in-command of the aircraft concerned shall be responsible for ensuring that the spacing from a preceding aircraft of a heavier wake turbulence category is acceptable. If it is determined that additional spacing is required, the flight crew shall inform the ATC unit accordingly, stating their requirements.

15.4.5.6 Transfer of communications to the aerodrome controller should be effected at such a point or time that information on essential local traffic, if applicable, and clearance to land or alternative instructions can be issued to the aircraft in a timely manner.

15.4. 6 INSTRUMENT APPROACH

Note. For local procedures at Sulaymaniyah International Airport, see Sulaymaniyah Local Operating Procedures (LOP) Chapter 7 and Appendix " P " of this Manual.

15.4.6.1 GENERAL

15.4.6.1.1 The approach control unit shall specify the instrument approach procedure to be used by arriving aircraft. A flight crew may request an alternative procedure and, if circumstances permit, should be cleared accordingly.

15.4. 6.1.2 If a pilot-in-command reports or if it is clearly apparent to the ATC unit that he is not familiar with an instrument approach procedure all of the following information, shall be specified in correct order, except that only the items mentioned in (a), (f), and (g) need be specified if the aircraft is to be cleared for a straight-in approach:-

a. "THIS IS THE APPROACH PROCEDURE FOR ... (aid).

b. initial approach altitude,

c. the point (in distance from the appropriate reporting point) at which the base/procedure turn will be started,

d. the direction of the procedure turn or base turn,

e. the level at which the turn shall be carried out,

f. the final approach track and level instructions,

g. the frequency(ies) of the navigation aid(s) to be used,

h. the missed approach procedure shall be specified when deemed necessary.

15.4.6.1.3 If the requirements of 15.4.6.1.2 above are met before completion of the approach procedure, the entire procedure shall nevertheless be executed unless the aircraft requests and is cleared for a visual approach.

15.4.6.1.4 If visual reference to terrain is established before completion of the approach procedure, the entire procedure must nevertheless be executed unless the aircraft requests and is cleared for a visual approach.

15.4.6.2 INSTRUMENT APPROACH PROCEDURES

Note. For more details see Doc 8168Volume I Section 4 (Arrival and Approach Procedures)

15.4.6.2.1 An instrument approach is a series of predetermined manoeuvers by reference to flight instruments with specified protection from obstacles from the initial approach fix or, where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed or if a landing is not completed to a position at which holding or en-route obstacle clearance criteria apply.

15.4.6.2.2 An instrument approach procedure may have 5 separate segments. The procedure is designed to protect aircraft from obstacles and keep them in protected airspace. It also provides a reference for controllers so that separations can be effected. They are as follows (Fig 15 -1):-

a. Arrival Route segment.

b. Initial Approach segment.

c. Intermediate Approach segment.

d. Final Approach segment.

e. Missed Approach segment.

Note. In addition, an area for circling the aerodrome under visual conditions is considered.

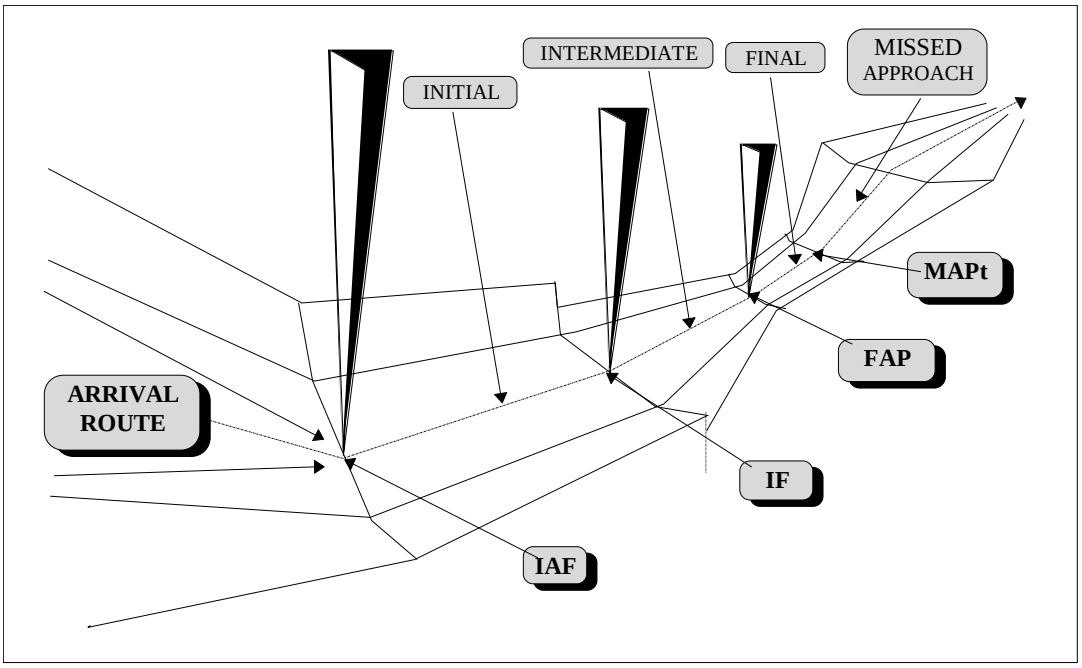

Fig 15 - 1

15.4.6.2.3 The segments begin and end at designated fixes. However, under some circumstances certain segments may begin at specified points where no fixes are available, e.g. the final approach segment of a precision approach may originate at the point of intersection of the designated intermediate flight altitude with the nominal glide path.

15.4.6.2.4 In the determination of the above arrival segments, the heights of obstacles within 25NM of the homing facility associated with the approach procedure are taken into account in order that a minimum of 1000ft clearance above obstacles is provided. This obstacle clearance is increased to 2000ft over or close to high terrain.

15.4.6.2.5 The vertical cross section of each segment is divided into primary and secondary areas. Full Minimum Obstacle Clearances (MOC) are applied over the primary areas reducing to zero at the outer edges of the secondary areas (Fig 15 - 2).

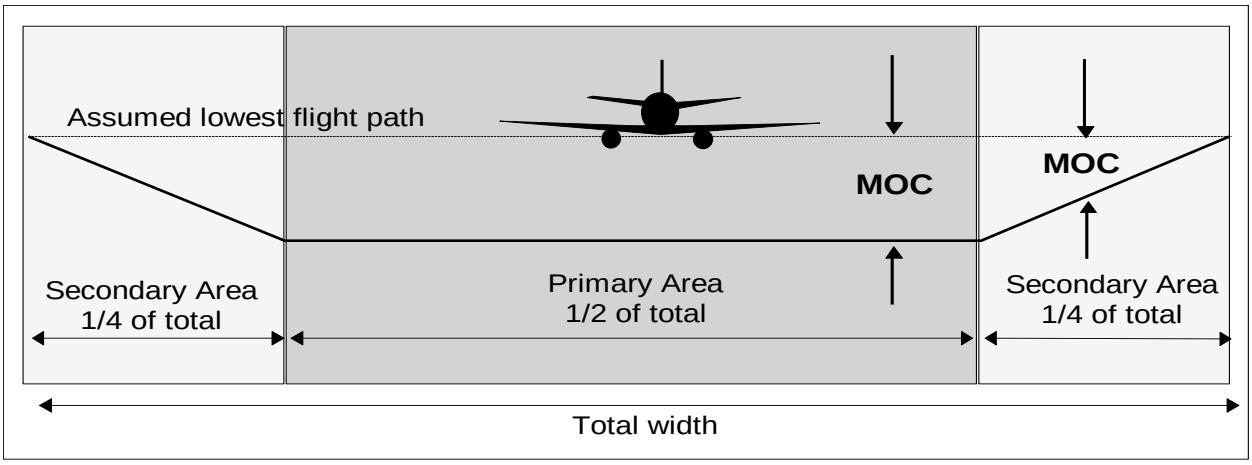

Fig 15 - 2

15.4.6.3 INSTRUMENT APPROACH SEGMENTS

15.4.6.3.1 The Arrival Route Segment

15.4.6.3.1.1 Arrival route segments normally begin at the end of the en-route phase of a flight and end at the Initial Approach Fix (IAF).

15.4.6.3.1.2 Arrival routes from the en-route phase are normally published where an operational advantage is obtained. Terminal radar is a suitable complement to published arrival routes where an aircraft can be vectored to a fix, or onto the intermediate or final approach track, where the approach can then be continued by the pilot through reference to the instrument approach chart.

Note. See Fig 15 – 1.

15.4.6.3.2 The Initial Approach Segment

15.4.6.3.2.1 The initial approach segment commences at the Initial Approach Fix (IAF) and ends at the Intermediate Fix (IF). In the initial approach, the aircraft has left the en-route structure and is manoeuvring to enter the intermediate approach segment.

15.4.6.3.2.2 The aircraft speed and configuration will depend on the distance from the fix and the descent profile required.

15.4.6.3.2.3 Where no suitable procedure is available for an instrument procedure as laid down in the schematic example in Fig 15 - 1 (i.e. a straight-in approach), then a series of procedure turns or holding patterns are required to enable the aircraft to perform an instrument let-down.

Note. See Fig 15 - 1

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15.4.6.3.2.4 Types of Manoeuvres

15.4.6.3.2.4.1 Reversal Procedure : The reversal procedure may be in the form of a procedure or base turn. Entry is restricted to a specific direction or sector. . In these cases, a specific pattern — normally a base turn or procedure turn — is prescribed. The directions and timing specified should be strictly followed in order to remain within the airspace provided. It should be noted that the airspace provided for these procedures does not permit a racetrack or holding manoeuvre to be conducted unless so specified. There are three generally recognized manoeuvres related to the reversal procedure, each with its own airspace characteristics:

a. 45°/180° procedure turn (see Fig. 15-3 A), starts at a facility or fix and consists of:

1. **a straight leg with track guidance. This straight leg may be timed or may be limited by a radial or DME distance;**

2. **a 45° turn;**

3. **a straight leg without track guidance. This straight leg is timed. It is:**

   i. **1 minute from the start of the turn for Category A and B aircraft; and**

   ii. **1 minute 15 seconds from the start of the turn for Category C, D and E aircraft; and**

4. a 180° turn in the opposite direction to intercept the inbound track.

The 45°/180° procedure turn is an alternative to the 80°/260° procedure turn [b) below] unless specifically excluded.

b. 80°/260° procedure turn (see Fig. 15-3 B), starts at a facility or fix and consists of:

1. a straight leg with track guidance. This straight leg may be timed or may be limited by a radial or DME distance;

2. an 80° turn;

3. a 260° turn in the opposite direction to intercept the inbound track.

The 80°/260° procedure turn is an alternative to the 45°/180° procedure turn [a) above] unless specifically excluded.

Note. The duration of the initial outbound leg of a procedure may be varied in accordance with aircraft speed categories in order to reduce the overall length of the protected area. In this case, separate procedures are published

c. Base turn, consisting of:

1. a specified outbound track and timing or DME distance from a facility; followed by

2. a turn to intercept the inbound track (see Fig. 15-3C).

The outbound track and/or the timing may be different for the various categories of aircraft. Where this is done, separate procedures are published.

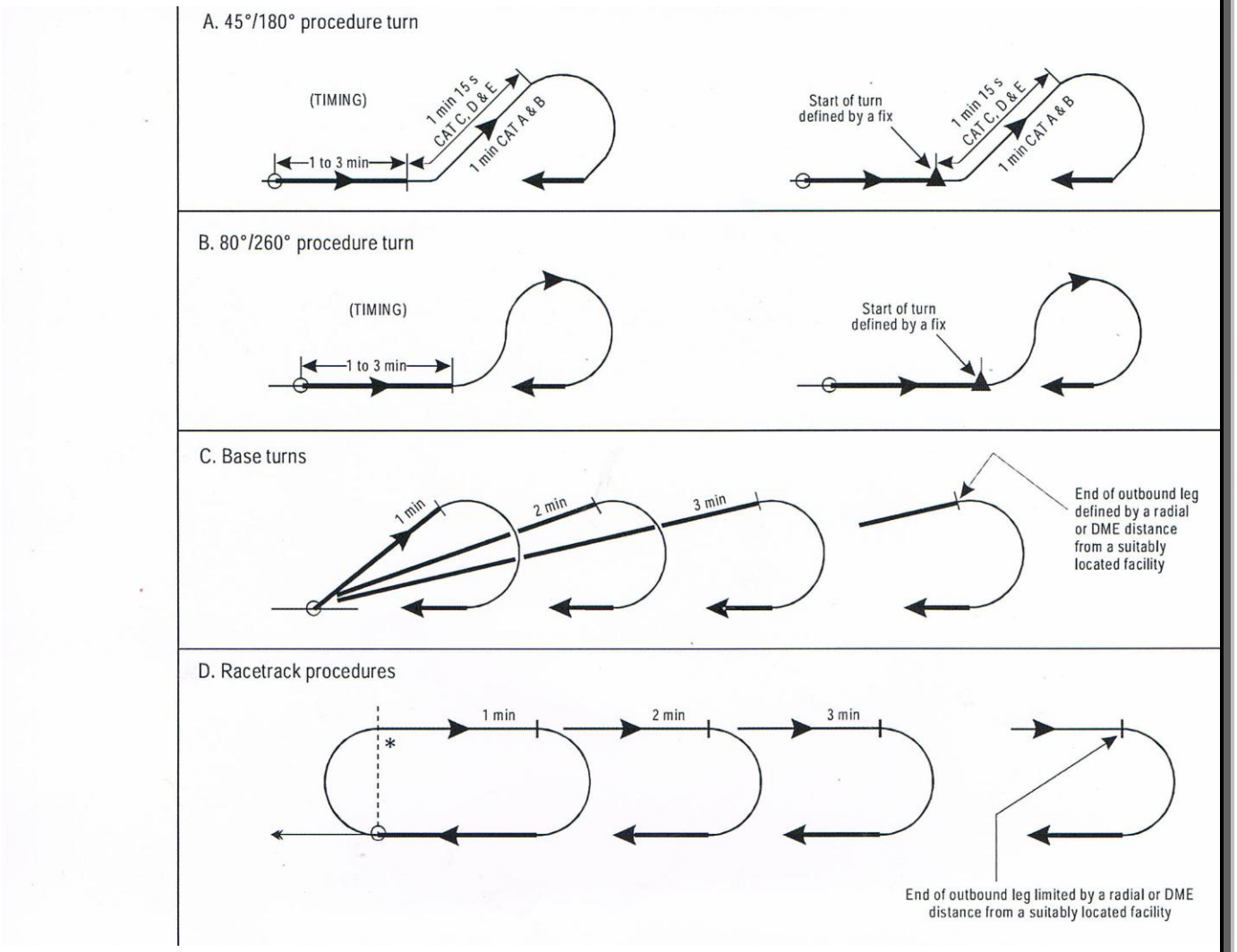

Fig 15 – 3 Types of reversal and racetrack procedures

Racetrack Procedure : A racetrack procedure consists of a turn from the inbound track through 180° from overhead the facility or fix on to the outbound track, for 1, 2 or 3 minutes , followed by a 180° turn in the same direction to return to the inbound track. A DME distance or intersecting radial / bearing may be used as an alternative to timing. Normally a racetrack procedure is used when aircraft arrive overhead the fix from various directions and when required to hold.(Fig 15 – 3D)

15.4.6.3.3 The Intermediate Approach Segment

15.4.6..3.3.1 Where a final approach fix (FAF) is available, the intermediate approach segment begins when the aircraft is on the inbound track of the procedure turn, base turn or final inbound leg of the racetrack procedure. It ends at the FAF or final approach point (FAP), as applicable.

Note. Where no FAF is specified, the inbound track is the final approach segment.

15.4.6.3.3.2 During this segment the aircraft speed and configuration is adjusted to prepare the aircraft for the final approach. For this reason the descent gradient is kept as shallow as possible.

15.4.6.3.4 The Final Approach Segment

15.4.6.3.4.1 This is the segment in which alignment and descent for landing are made. Final approach may be made to a runway for a straight-in landing, or to an aerodrome for a visual manoeuvre.

15.4.6.3.4.2 The criteria for final approach vary according to the type. These types are:

a. Non-precision approach (NPA) with final approach fix (FAF);
b. NPA without FAF;
c. Approach with vertical guidance (APV); and
d. Precision approach (PA).

15.4.6.3.5 The Missed Approach Segment

15.4.6.3.5.1 During the missed approach phase of the instrument approach procedure, the pilot is faced with the demanding task of changing the aircraft configuration, attitude and altitude. For this reason, the design of the missed approach has been kept as simple as possible and consists of three phases (initial, intermediate and final). See Fig. 15 – 4

15.4.6.3.5.2 It is expected that the pilot will fly the missed approach procedure as published. If a missed approach is initiated before arriving at the missed approach point (MAPt), the pilot will normally proceed to the MAPt (or to the middle marker fix or specified DME distance for precision approach procedures) and then follow the missed approach procedure in order to remain within the protected airspace.

a. INITIAL PHASE: The initial phase begins at the MAPt and ends at the start of climb (SOC). This phase requires the concentrated attention of the pilot on establishing the climb and the changes in aeroplane configuration. It is assumed that guidance equipment is not extensively utilized during these manoeuvres, and for this reason, no turns are specified in this phase.

b. INTERMEDIATE PHASE: The intermediate phase begins at the SOC. The climb is continued, normally straight ahead. It extends to the first point where 50 m (164 ft) obstacle clearance is obtained and can be maintained. The intermediate missed approach track may be changed by a maximum of 15° from that of the initial missed approach phase. During this phase, it is assumed that the aircraft begins track corrections.

c. FINAL PHASE: The final phase begins at the point where 50 m (164 ft) obstacle clearance is first obtained and can be maintained. It extends to the point where a new approach, holding or a return to en-route flight is initiated. Turns may be prescribed in this phase.

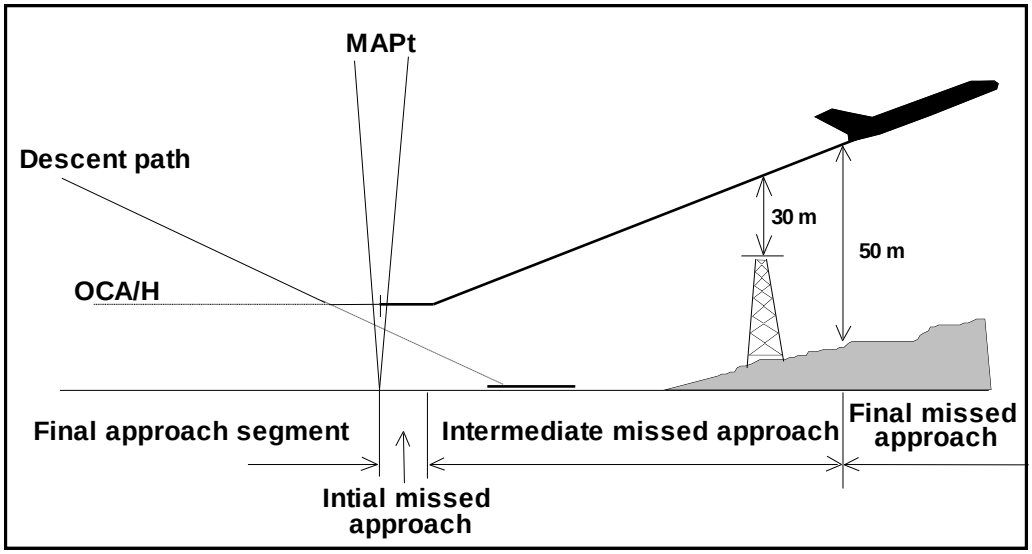

Fig 15 – 4

15.4.6.4 INSTRUMENT OPERATIONS

15.4.6.4.1 Instrument approach operations are divided as follows:-

a. **Non-precision approaches : An instrument approach and landing which does not utilize electronic glide path guidance.**

b. **Precision approaches : An instrument approach and landing using precision azimuth and glide path guidance with minima as determined by the category of operation.**

15.4.6.4.2 CATEGORIES OF PRECISION APPROACH

15.4.6.4.2.1 Category I (Cat I) Operation: A precision instrument approach and landing with a decision height not lower than 200ft and with either a visibility not less than 800m, or a runway visual range (RVR) not less than 550m.

15.4.6.4.2.2 Category II (Cat II) Operation: A precision instrument approach and landing with a decision height lower than 200ft but not lower than 100ft, and RVR not less than 350m.

15.4.6.4.2.3 Category IIIA (Cat IIIA) Operation: A precision instrument approach and landing with either, a decision height lower than 100ft, or with no decision height and RVR not less than 200m.

15.4.6.4.2.4 Category IIIB (Cat IIIB) Operation: A precision instrument approach and landing with either, a decision height lower than 50ft, or with no decision height and RVR less than 200m but not less than 50m.

15.4.6.4.2.5 Category IIIC (Cat IIIC) Operation: A precision instrument approach and landing with no decision height and no RVR limitations.

15.4.6.4.2.6 When the decision height (DH) and RVR do not fall within the same category, the decision height or the RVR may determine in which category the operation is to be considered. The operation will be in the category with the lower minima.

15.4.7 HOLDING

15.4.7.1 General

15.4.7.1.1 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.

15.4.7.1.2 When delay is expected, the ACC shall normally be responsible for clearing aircraft to the holding fix, and for including holding instructions, and expected approach time or onward clearance time, as applicable, in such clearances. (For onward clearance time See Section 15.4.10 of this manual)

15.4.7.1.3 After coordination with the approach control unit, the ACC may clear an arriving aircraft to a visual holding location to hold until further advised by the approach control unit.

15.4.7.1.4 After coordination with the aerodrome control tower, the approach control unit may clear an arriving aircraft to a visual holding location to hold until further advised by the aerodrome control tower.

15.4.7.1.5 Holding and holding pattern entry shall be accomplished in accordance with procedures established by the appropriate ATS authority and published in AIPs. 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 the designator of the location or aid to be used, the inbound track, radial or bearing, direction of turn in the holding pattern as well as the time of the outbound leg or the distances between which to hold.

15.4.7.1.6 Aircraft should normally be held at a designated holding fix. 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 Chapter 11(Separation) Section 11.4 of this manual, concerning separation of aircraft holding in flight.

15.4.7.1.7 Levels at a holding fix or visual holding location 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 fix or visual holding location should be at the lowest level, with following aircraft at successively higher levels.

15.4.7.1.8 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.

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

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

15.4.7.1.11 Departure times of aircraft from the holding facility shall be based on the desired time interval between aircraft landing. If the weather conditions are such that the pilot may encounter difficulty in completing the landing, the time interval may be increased sufficiently to allow the first aircraft to land before the second aircraft commences descent on final approach.

15.4.7.2 HOLDING PROCEDURES

15.4.7.2.1 The shape and terminology associated with a typical holding pattern is shown in Fig. 15 - 5.

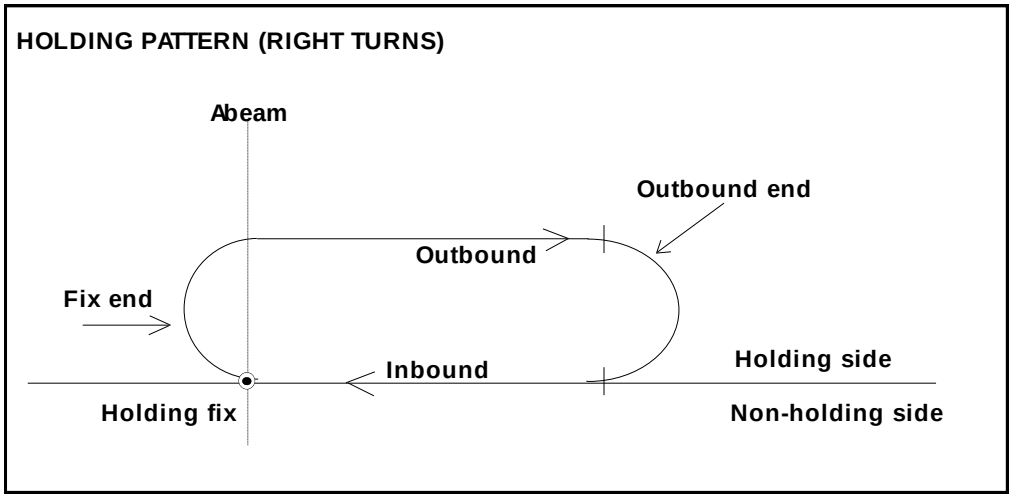

Fig 15 - 5

15.4.7.2.2 All procedures depict tracks and pilots maintain the track by making allowance for known wind by applying corrections both to heading and timing during entry and while flying in the holding pattern.

15.4.7.2.3 All turns are made at rate one i.e. bank angle of 25° (3°/sec turn rate).

15.4.7.2.4 Outbound timings normally begin over or abeam the fix whichever occurs later.

15.4.7.2.5 The entry into the holding pattern shall be according to heading in relation to the three entry sectors shown in Fig 15 -6 below.

15.4.7.2.6 The entries are defined as follows (See Fig 15 - 6):-

a. Sector 1 procedure (parallel entry): Having reached the fix, the aircraft is turned left onto an outbound heading for the appropriate period of time or until reaching the DME limiting outbound distance, then, the aircraft is turned left onto the holding side to intercept the inbound track or to return to the fix, then, on second arrival over the fix, the aircraft is turned right to follow the holding pattern.

b. Sector 2 procedure (offset entry): Having reached the fix, the aircraft is turned onto a heading to make good a track making an angle of 30° from the reciprocal of the inbound track on the holding side, then, the aircraft is flown outbound as appropriate before turning right to intercept the inbound holding track, then, on the second arrival over the holding fix, the aircraft is turned right to follow the holding pattern.

c. Sector 3 procedure (direct entry): Having reached the fix, the aircraft is turned right to follow the holding pattern.

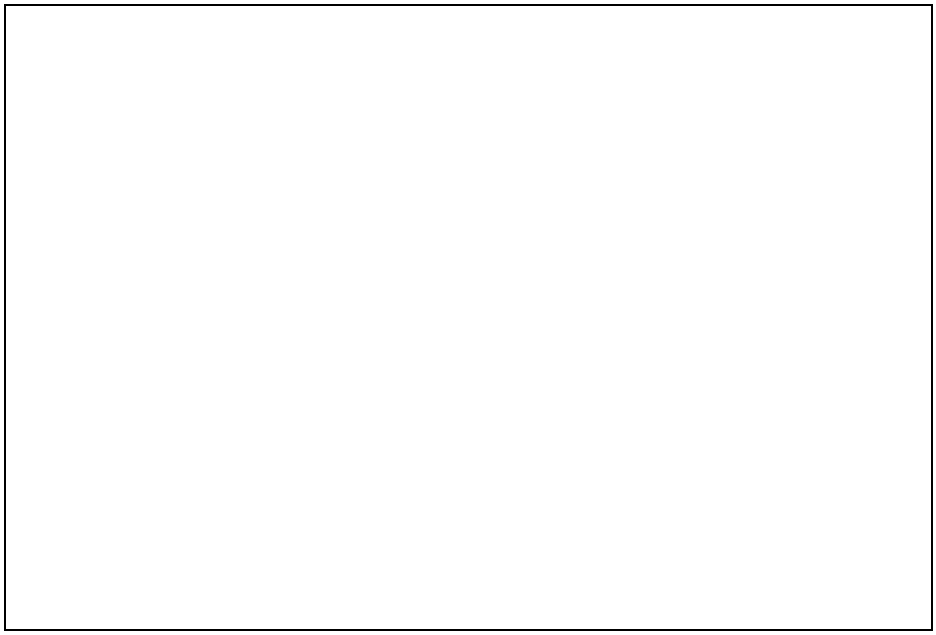

Fig 15 – 6

15.4.7.3 CATEGORIES OF AIRCRAFT

15.4.7.3.1 Aircraft performance has a direct effect on the airspace and visibility needed to perform the various manoeuvres associated with the conduct of instrument approach procedures as outlined in this chapter. The most significant performance factor is aircraft speed. Accordingly five categories of typical aircraft have been established based on 1.3 times the stall speed in the landing configuration at maximum certified landing mass, to provide a standard basis for relating aircraft manoeuverability to specific instrument approach procedures.

Category A: less than 169 km/h (91 kt) indicated airspeed (IAS)
Category B: **169 km/h (91 kt) or more but less than 224 km/h (121 kt) IAS**
Category C: **224 km/h (121 kt) or more but less than 261 km/h (141 kt) IAS**
Category D: **261 km/h (141 kt) or more but less than 307 km/h (166 kt) IAS**
Category E: **307 km/h (166 kt) or more but less than 391 km/h (211 kt) IAS**

15.4.7.3.2 The above categories of aircraft are used in the determination and in the calculation of all aspects of approach procedures and to provide protected airspace against terrain and other adjacent airspace i.e. restricted areas.

15.4.8 APPROACH SEQUENCING

15.4.8.1 GENERAL

15.4.8.1.1 The approach sequence shall be established in a manner which will facilitate arrival of the maximum number of aircraft with the least average delay, taking into account priority categories, e.g.:

a. An aircraft which anticipates being compelled to land because of factors affecting the safe operation of the aircraft (engine failure, shortage of fuel etc.).

b. Hospital aircraft or aircraft carrying any sick or seriously injured person requiring urgent medical attention.

C . aircraft engaged in search and rescue operations; and

d. other aircraft as may be determined by the appropriate authority.

Note. An aircraft which has encountered an emergency is handled as outlined in Chapter 19 (Procedures related to emergencies, Communication Failure and Contingencies).

15.4.8.1.2 Succeeding aircraft shall be cleared for approach :-

a. when the preceding aircraft has reported that it is able to complete its approach without encountering instrument meteorological conditions; or

b. when the preceding aircraft is in communication with and sighted by the aerodrome control tower, and reasonable assurance exists that a normal landing can be accomplished, or

c. when timed approaches are used, the preceding aircraft has passed the defined point inbound, and reasonable assurance exists that a normal landing can be accomplished;

Note. See 15.4.8.2.1 of this manual concerning timed approach procedures.

d. when the use of an ATS surveillance system confirms that the required longitudinal spacing between succeeding aircraft has been established.

e. when the preceding aircraft has landed, whichever is the earliest.

15.4.8.1.3 In establishing the approach sequence, the need for increased longitudinal spacing between arriving aircraft due to wake turbulence shall be taken into account.

15.4.8.1.4 If the pilot of an aircraft in an approach sequence has indicated an intention to hold for weather improvement, or for other reasons, such action shall be approved. However, when other holding aircraft indicate intention to continue their approach-to-land, the pilot desiring to hold will be cleared to an adjacent fix for holding awaiting weather change or re-routing. Alternatively, the aircraft should be given a clearance to place it at the top of the approach sequence so that other holding aircraft may be permitted to land. Coordination shall be effected with any adjacent ATC unit or control sector, when required, to avoid conflict with the traffic under the jurisdiction of that unit or sector.

15.4.8.1.5 When establishing the approach sequence, an aircraft which has been authorized to absorb a specified period of notified terminal delay by cruising at a reduced speed en route, should, in so far as practicable, be credited with the time absorbed en route.

15.4.8.2 SEQUENCING AND SPACING OF INSTRUMENT APPROACHES

15.4.8.2.1 TIMED APPROACH PROCEDURES

15.4.8.2.1.1 Subject to approval by the appropriate ATS authority, the following procedure should be utilized as necessary to expedite the approaches of a number of arriving aircraft:

a. a suitable point on the approach path, which shall be capable of being accurately determined by the pilot, shall be specified, to serve as a checkpoint in timing successive approaches;

b. aircraft shall be given a time at which to pass the specified point inbound, which time shall be determined with the aim of achieving the desired interval between successive landings on the runway while respecting the applicable separation minima at all times, including the period of runway occupancy.

15.4.8.2.1.2 The time at which aircraft should pass the specified point shall be determined by the unit providing approach control service and notified to the aircraft sufficiently in advance to permit the pilot to arrange the flight path accordingly.

15.4.8.2.1.3 Each aircraft in the approach sequence shall be cleared to pass the specified point inbound at the previously notified time, or any revision thereof, after the preceding aircraft has reported passing the point inbound.

15.4.8.2.2 INTERVAL BETWEEN SUCCESSIVE APPROACHES

15.4.8.2.2.1 In determining the time interval or longitudinal distance to be applied between successive approaching aircraft, the relative speeds between succeeding aircraft, the distance from the specified point to the runway, the need to apply wake turbulence separation, runway occupancy times, the prevailing meteorological conditions as well as any condition which may affect runway occupancy times shall be considered. When an ATS surveillance system is used to establish an approach sequence, the minimum distance to be established between succeeding aircraft shall be specified in local instructions. Local instructions shall additionally specify the circumstances under which any increased longitudinal distance between approaches may be required as well as the minima to be used under such circumstances.

15.4.8.2.3 INFORMATION ON APPROACH SEQUENCE

15.4.8.2.3.1 Provision shall be made to ensure that the aerodrome control tower is kept informed of the sequence in which aircraft will be established on final approach for landing.

Note 1. Guidance material on factors to be taken into account when determining separation for timed approaches is contained in the Air Traffic Services Planning Manual *(Doc 9426).*

Note 2. Wake turbulence categories and wake turbulence separation minima are contained in Chapter 14, Section 14.3.4.1 and Section 14.10.4, Of this manual respectively.

Note 3. Detailed characteristics of wake vortices and their effect on aircraft are contained in the Air Traffic Services Planning Manual *(Doc 9426), Part II, Section 5.*

15.4.9 EXPECTED APPROACH TIME

15.4.9.1 Expected Approach Time is the time at which ATC expects that an arriving aircraft, following a delay, will leave the holding point to complete its approach for a landing.

15.4.9.2 An expected approach time shall be determined for an arriving aircraft that will be subjected to a delay of 10 minutes or more or such other period as has been determined by the appropriate authority.

Note 1. See Doc 4444 Chapter 6, Section 6.5.7.1

Note 2. For local procedures at Sulaymaniyah International Airport, see Sulaymaniyah Local Operating Procedures (LOP) Chapter 7, Section 7.3.8.3.

15.4.9.3 The expected approach time shall be transmitted to the aircraft as soon as practicable and preferably not later than at the commencement of its initial descent from cruising level.

15.4.9.4 A revised expected approach time shall be transmitted to the aircraft without delay whenever it differs from that previously transmitted by 5 minutes or more, or such lesser period of time as has been established by the appropriate ATS authority or agreed between the ATS units concerned.

Note. For local procedures at Sulaymaniyah International Airport, see Sulaymaniyah Local Operating Procedures (LOP) Chapter 7, Section 7.3.8.3.2.

15.4.9.5 An expected approach time shall be transmitted to the aircraft by the most expeditious means whenever it is anticipated that the aircraft will be required to hold for 30 minutes or more.

15.4.9.6 The holding fix to which an expected approach time relates shall be identified together with the expected approach time whenever circumstances are such that this would not otherwise be evident to the pilot.

15.4.9.7 When an expected approach clearance time cannot be determined due to the presence of adverse weather, blocked runway or other similar condition rendering the airfield unusable, pilots shall be so informed in the following manner:

"... (callsign) DELAY NOT DETERMINED...(reason/s)".

15.4.9.8 If the pilot of an aircraft in an approach sequence has indicated his intention to hold for weather improvement or for other reasons, such action shall be approved. However, this may affect his position in the landing sequence should other aircraft higher in the approach sequence decide to attempt an approach.

15.4.10 ONWARD CLEARANCE TIME

15.4.10.1 In the event that an aircraft is held en-route or at a location or navigation aid other than the initial approach fix, the aircraft concerned shall, as soon as practicable, be given an expected onward clearance time (the time at which an aircraft can expect to leave the point at which it is being held) from the holding fix. The aircraft shall also be advised if further holding at subsequent holding fix is expected.

Note. "Onward clearance time" is the time at which an aircraft can expect to leave the fix at which it is being held.

15.4.11 INFORMATION FOR ARRIVING AIRCRAFT

15.4.11.1 As early as practicable after an aircraft has established communication with the unit providing approach control service, the following elements of information, in the order listed, shall be transmitted to the aircraft, with the exception of such elements which it is known the aircraft has already received:

a. type of approach and runway-in-use;

b. meteorological information, as follows:

1. surface wind direction and speed, including significant variations;

2. visibility and, when applicable, runway visual range (RVR);

3. present weather;

4. 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;

5. air temperature;

6. dew point temperature, inclusion determined on the basis of a regional air navigation agreement;

7. altimeter setting(s);

8. any available information on significant meteorological phenomena in the approach area; and

9. trend-type landing forecast, when available.

Note. The meteorological information listed above is identical to that required in ATIS broadcasts for arriving aircraft as specified in Annex 11, Section 4.3.7 "j" to " r" and is to be extracted from local meteorological routine and special reports, in accordance with Doc 4444 Chapter 11, Sections 11.4.3.2.2 to 11.4.3.2.3.

c. current runway surface conditions, in case of precipitants or other temporary hazards;

d. changes in the operational status of visual and non-visual aids essential for approach and landing.

15.4.11.2 In applying the provisions in 15.5.3.1.1 of this manual , it should be recognized that information published by NOTAM or disseminated by other means may not have been received by the aircraft prior to departure or during en-route flight.

15.4.11.3 If it becomes necessary or operationally desirable that an arriving aircraft follow an instrument approach procedure or use a runway other than that initially stated, the flight crew shall be advised without delay.

15.4.11.4 At the commencement of final approach, the following information shall be transmitted to aircraft:

a. significant changes in the mean surface wind direction and speed;

Note. Significant changes are specified in Annex 3, Chapter 4. However, if the controller possesses wind information in the form of components, the significant changes are:

— Mean head-wind component: 19 km/h (10 kt)

— Mean tail-wind component: 4 km/h (2 kt)

— Mean cross-wind component: 9 km/h (5 kt)

b. the latest information, if any, on wind shear and/or turbulence in the final approach area;

c. the current visibility representative of the direction of approach and landing or, when provided, the current runway visual range value(s) and the trend.

15.4.11.5 During final approach, the following information shall be transmitted without delay:

a. the sudden occurrence of hazards (e.g. unauthorized traffic on the runway);

b. significant variations in the current surface wind, expressed in terms of minimum and maximum values;

c. significant changes in runway surface conditions;

d. changes in the operational status of required visual or non-visual aids;

e. changes in observed RVR value(s), in accordance with the reported scale in use, or changes in the visibility representative of the direction of approach and landing.

15.5 OPERATIONS ON PARALLEL OR NEAR-PARALLEL RUNWAYS

15.5.1 GENERAL

15.5.1.1 Where parallel or near-parallel runways are used for simultaneous operations, the requirements and procedures below shall apply.

Note. Guidance material is contained in the Manual on Simultaneous Operations on Parallel or Near-Parallel Instrument Runways *(SOIR) (Doc 9643).*

15.5.2 DEPARTING AIRCRAFT

15.5.2.1 Types Of Operation

15.5.2.1.1 Parallel runways may be used for independent instrument departures as follows:

a. both runways are used exclusively for departures (independent departures);

b. one runway is used exclusively for departures while the other runway is used for a mixture of arrivals and departures (semi-mixed operation); and

c. both runways are used for mixed arrivals and departures (mixed operation).

15.5.2.2 Requirements And Procedures For Independent Parallel Departures

15.5.2.2.1 Independent IFR departures may be conducted from parallel runways provided:

a. the runway centre lines are spaced by the distance specified in Annex 14, Volume I

b. the departure tracks diverge by at least 15 degrees immediately after take-off;

c. suitable surveillance radar capable of identification of the aircraft within 2 km (1.0 NM) from the end of the runway is available; and

d. ATS operational procedures ensure that the required track divergence is achieved.

15.5.3 ARRIVING AIRCRAFT

15.5.3.1 Types Of Operations

15.5.3.1.1 Parallel runways may be used for simultaneous instrument operations for:

a. independent parallel approaches; or

b. dependent parallel approaches; or

c. segregated parallel operations.

15.5.3.1.2 Whenever parallel approaches are carried out, separate controllers should be responsible for the sequencing and spacing of arriving aircraft to each runway.

15.5.3.2 Requirements And Procedures For Independent Parallel Approaches

15.5.3.2.1 Independent parallel approaches may be conducted to parallel runways provided that:

a. the runway centre lines are spaced by the distance specified in Annex 14, Volume I; and

1. **where runway centre lines are spaced by less than 1 310 m but not less than 1 035 m, suitable secondary surveillance radar (SSR) equipment, with a minimum azimuth accuracy of 0.06 degrees(one sigma), an update period of 2.5 seconds or less and a high resolution display providing position prediction and deviation alert, is available; or**

2. **where runway centre lines are spaced by less than 1 525 m but not less than 1 310 m, SSR equipment with performance specifications other than the foregoing may be applied, provided they are equal to or better than those stated under 3) below, and when it is determined that the safety of aircraft operation would not be adversely affected; or**

3. **where runway centre lines are spaced by 1 525 m or more, suitable surveillance radar with a minimum azimuth accuracy of 0.3 degrees (one sigma) or better and update period of 5 seconds or less is available;**

b. instrument landing system (ILS) and/or microwave landing system (MLS) approaches are being conducted on both runways;

c. the missed approach track for one approach diverges by at least 30 degrees from the missed approach track of the adjacent approach;

d. an obstacle survey and evaluation is completed, as appropriate, for the areas adjacent to the final approach segments;

e. aircraft are advised of the runway identification and ILS localizer or MLS frequency as early as possible;

f. vectoring is used to intercept the ILS localizer course or the MLS final approach track;

g. a no transgression zone (NTZ) at least 610 m (2 000 ft) wide is established equidistant between extended runway centre lines and is depicted on the radar display;

h. separate controllers monitor the approaches to each runway and ensure that when the 300 m (1 000 ft) vertical separation is reduced:

1. aircraft do not penetrate the depicted NTZ; and

2. the applicable minimum longitudinal separation between aircraft on the same ILS localizer course or MLS final approach track is maintained; and

i. if no dedicated radio channels are available for the controllers to control the aircraft until landing:

1. transfer of communication of aircraft to the respective aerodrome controller's channel is effected before the higher of two aircraft on adjacent final approach tracks intercepts the ILS glide path or the specified MLS elevation angle; and

2. the controllers monitoring the approaches to each runway are provided with the capability to override transmissions of aerodrome control on the respective radio channels for each arrival flow.

15.5.3.2.2 As early as practicable after an aircraft has established communication with approach control, the aircraft shall be advised that independent parallel approaches are in force. This information may be provided through the ATIS broadcasts.

15.5.3.2.3 When vectoring to intercept the ILS localizer course or MLS final approach track, the final vector shall enable the aircraft to intercept the ILS localizer course or MLS final approach track at an angle not greater than 30 degrees and to provide at least 2 km (1.0 NM) straight and level flight prior to ILS localizer course or MLS final approach track intercept. The vector shall also enable the aircraft to be established on the ILS localizer course or MLS final approach track in level flight for at least 3.7 km (2.0 NM) prior to intercepting the ILS glide path or specified MLS elevation angle.

15.5.3.2.4 A minimum of 300 m (1 000 ft) vertical separation or, subject to radar system and radar display capabilities, a minimum of 5.6 km (3.0 NM) radar separation shall be provided until aircraft are established:

a. inbound on the ILS localizer course and/or MLS final approach track; and

b. within the normal operating zone (NOZ).

15.5.3.2.5 Subject to radar system and situation display capabilities, a minimum of 5.6 km (3.0 NM) radar separation shall be provided between aircraft on the same ILS localizer course or MLS final approach track unless increased longitudinal separation is required due to wake turbulence or for other reasons.

Note . An aircraft established on an ILS localizer course or MLS final approach track is separated from another aircraft established on an adjacent parallel ILS localizer course or MLS final approach track provided neither aircraft penetrates the NTZ as depicted on the situation display.

15.5.3.2.6When assigning the final heading to intercept the ILS localizer course or MLS final approach track, the runway shall be confirmed, and the aircraft shall be advised of:

1. **its position relative to a fix on the ILS localizer course or MLS final approach track;**
2. **the altitude to be maintained until established on the ILS localizer course or MLS final approach track to the ILS glide path or specified MLS elevation angle intercept point; and**
3. **if required, clearance for the appropriate ILS or MLS approach.**

15.5.3.2.7 All approaches regardless of meteorological conditions shall be provided with flight path monitoring using radar. Control instructions and information necessary to ensure separation between aircraft and to ensure aircraft do not enter the NTZ shall be issued.

Note 1. The primary responsibility for navigation on the ILS localizer course and/or MLS final approach track rests with the pilot. Control instructions and information are therefore issued only to ensure separation between aircraft and to ensure that aircraft do not penetrate the NTZ.

Note 2. For the purpose of ensuring an aircraft does not penetrate the NTZ, the aircraft is considered to be the centre of its position symbol. However, the edges of the position symbols representing aircraft executing parallel approaches are not allowed to touch.

15.5.3.2.8 When an aircraft is observed to overshoot the turn-on or to continue on a track which will penetrate the NTZ, the aircraft shall be instructed to return immediately to the correct track.

15.5.3.2.9 When an aircraft is observed penetrating the NTZ, the aircraft on the adjacent ILS localizer course or MLS final approach track shall be instructed to immediately climb and turn to the assigned altitude/height and heading in order to avoid the deviating aircraft. Where parallel approach obstacle assessment surfaces (PAOAS) criteria are applied for the obstacle assessment, the air traffic controller shall not issue the heading instruction to the aircraft below 120 m (400 ft) above the runway threshold elevation, and the heading instruction shall not exceed 45 degrees track difference with the ILS localizer course or MLS final approach track.

15.5.3.2.10 Flight path monitoring using radar shall not be terminated until:

a. visual separation is applied, provided procedures ensure that both controllers are advised whenever visual separation is applied;

b. the aircraft has landed, or in case of a missed approach, is at least 2 km (1.0 NM) beyond the departure end of the runway and adequate separation with any other traffic is established.

Note. There is no requirement to advise the aircraft that flight path monitoring using radar is terminated.

15.5.3.3 Suspension Of Independent Parallel Approaches To Closely – Spaced Parallel Runways

Independent parallel approaches to parallel runways spaced by less than 1 525 m between their centre lines shall be suspended under certain meteorological conditions, as prescribed by the appropriate ATS authority, including wind shear, turbulence, downdrafts, crosswind and significant meteorological conditions such as thunderstorms, which might otherwise increase ILS localizer course and/ or MLS final approach track deviations to the extent that safety may be impaired.

Note 1. The increase in final approach track deviations would additionally result in an unacceptable level of deviation alerts being generated.

Note 2. Guidance material relating to meteorological conditions is contained in the Manual on Simultaneous Operations on Parallel or Near-Parallel Instrument Runways*(SOIR) (Doc 9643).*

15.5.3.4 Requirements And Procedures For Dependent Parallel Approaches

15.5.3.4.1 Dependent parallel approaches may be conducted to parallel runways provided:

a. the runway centre lines are spaced by the distance specified in Annex 14, Volume I;

b. the aircraft are vectored to intercept the final approach track;

c. suitable surveillance radar with a minimum azimuth accuracy of 0.3 degrees (one sigma) and update period of 5 seconds or less is available;

d. ILS and/or MLS approaches are being conducted on both runways;

e. aircraft are advised that approaches are in use to both runways (this information may be provided through the ATIS);

f. the missed approach track for one approach diverges by at least 30 degrees from the missed approach track of the adjacent approach; and

g. approach control has a frequency override capability to aerodrome control.

15.5.3.4.2 A minimum of 300 m (1 000 ft) vertical separation or a minimum of 5.6 km (3.0 NM) radar separation shall be provided between aircraft during turn-on to parallel ILS localizer courses and/or MLS final approach tracks.

15.5.3.4.3 The minimum radar separation to be provided between aircraft established on the ILS localizer course and/ or MLS final approach track shall be:

a. 5.6 km (3.0 NM) between aircraft on the same ILS localizer course or MLS final approach track unless increased longitudinal separation is required due to wake turbulence; and

b. 3.7 km (2.0 NM) between successive aircraft on adjacent ILS localizer courses or MLS final approach tracks.

15.5.3.5 Requirements And Procedures For Segregated Parallel Operations

15.5.3.5.1 Segregated parallel operations may be conducted on parallel runways provided:

a. the runway centre lines are spaced by the distance specified in Annex 14, Volume I; and

b. the nominal departure track diverges immediately after take-off by at least 30 degrees from the missed approach track of the adjacent approach (see Figure 15 - 7).

15.5.3.5.2 The minimum distance between parallel runway centre lines for segregated parallel operations may be decreased by 30 m for each 150 m that the arrival runway is staggered toward the arriving aircraft, to a minimum of 300 m (see Figure 15 - 8) and should be increased by 30 m for each 150 m that the arrival runway is staggered away from the arriving aircraft (see Figure 15 - 9).

15.5.3.5.3 The following types of approaches may be conducted in segregated parallel operations provided suitable surveillance radar and the appropriate ground facilities conform to the standard necessary for the specific type of approach:

a. ILS and/or MLS precision approach;

b. surveillance radar approach (SRA) or precision approach radar (PAR) approach; and

c. visual approach.

Note. Guidance material is contained in the Manual on Simultaneous Operations on Parallel or Near-Parallel Instrument Runways *(SOIR) (Doc 9643).*

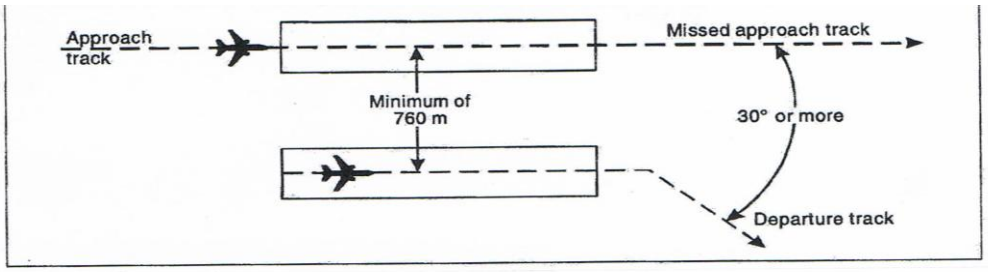

Fig 15 – 7
Segregated parallel operations

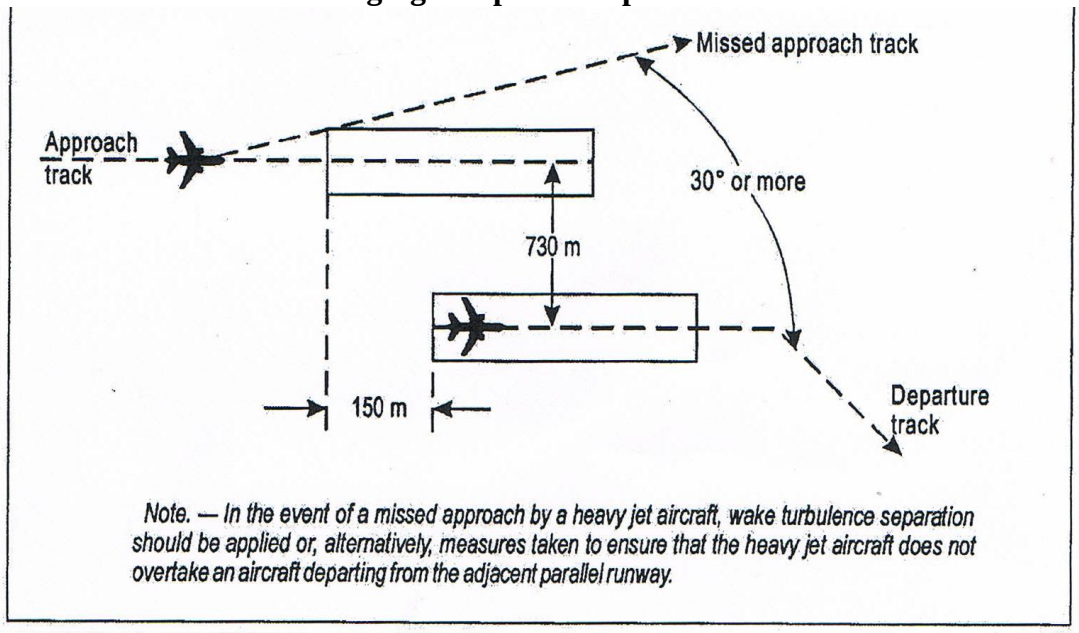

Fig 15 – 8
Segregated parallel operations where runways are staggered

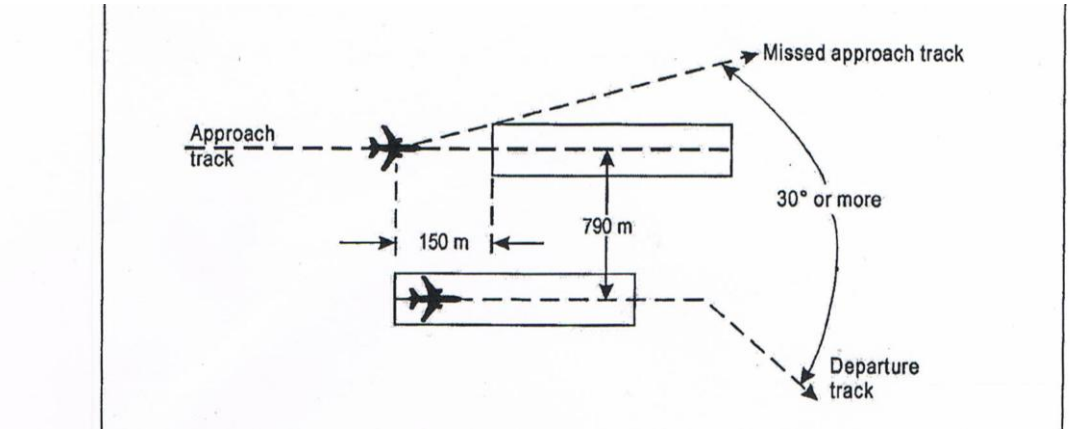

Fig 15 - 9
Segregated parallel operations where runways are staggered