

KURDISTAN REGIONAL GOVERNMENT



SULAYMANIYAH INTERNATIONAL AIRPORT

MATS

CHAPTER 19

**PROCEDURES RELATED TO EMERGENCIES,
COMMUNICATION FAILURE AND
CONTINGENCIES**

(First Edition)

April 2012

Prepared By

**Fakhir .F. Mohammed
Civil Aviation Consultant**

TABLE OF CONTENTS

Subjects	Page
-----	-----
19.1 Emergency procedures	19-1
19.1.1 General	19-1
19.1.2 Priority	19-2
19.1.3 Unlawful interference & aircraft bomb threat.....	19-2
19.1.4 Emergency descent	19-5
19.2 Special procedures for in-flight contingencies	19-6
in oceanic airspace	
19.2.1 Introduction	19-6
19.2.2 General procedures	19-6
19.2.3 Weather deviation procedures.....	19-8
19.2.4 Procedures for strategic lateral offset in	19-11
oceanic and remote continental airspace	
19.3 Air-Ground communication failure.....	19-13
19.4 Assistance to VFR flights	19-17
19.4.1 Strayed VFR flights and VFR flights	19-17
encountering adverse meteorological conditions	
19.5 Other in-flight contingencies	19-19
19.5.1 Strayed or unidentified aircraft	19-19
19.5.2 Interception of civil aircraft	19-21
19.5.3 Fuel dumping	19-22
19.5.4 descents by supersonic aircraft due	19-24
to solar comic radiation	
19.6 ATC contingencies	19-24
19.6.1 Radio communication contingencies	19-25
19.7 Other ATC contingencies procedures	19-27
19.7.1 Emergency separation	19-27
19.7.2 Short-term conflict alert (STCA) procedures	19-27
19.7.3 Procedures in regard to aircraft equipped with	19-29
Airborne Collision Avoidance System (ACAS)	
19.7.4 Minimum Safe Altitude Warning (MSAW)	19-30
Procedures	
19.7.5 Change of radiotelephony call sign for aircraft	19-31

CHAPTER 19

PROCEDURES RELATED TO EMERGENCIES, COMMUNICATION FAILURE AND CONTINGENCIES

19.1 EMERGENCY PROCEDURES

19.1.1 General

19.1.1.1 The various circumstances surrounding each emergency situation preclude the establishment of exact detailed procedures to be followed. The procedures outlined herein are intended as a general guide to air traffic services personnel. Air traffic control units shall maintain full and complete coordination, and personnel shall use their best judgement in handling emergency situations.

Note 1. Additional radar procedures to be applied in relation to emergencies and contingencies are contained in Chapter 16, 16.10.1 of this manual.

Note 2. If the pilot of an aircraft encountering a state of emergency has previously been directed by ATC to operate the transponder on a specific code, that code will normally be maintained unless, in special circumstances, the pilot has decided or has been advised otherwise. Where ATC has not requested a code to be set, the pilot will set the transponder to Mode A Code 7700.

19.1.1.2 When an emergency is declared by an aircraft, the ATS unit should take appropriate and relevant action as follows:

- a. unless clearly stated by the flight crew or otherwise known, take all necessary steps to ascertain aircraft identification and type, the type of emergency, the intentions of the flight crew as well as the position and level of the aircraft;
- b. decide upon the most appropriate type of assistance which can be rendered;

- c. enlist the aid of any other ATS unit or other services which may be able to provide assistance to the aircraft;
- d. provide the flight crew with any information requested as well as any additional relevant information, such as details on suitable aerodromes, minimum safe altitudes, weather information;
- e. obtain from the operator or the flight crew such of the following information as may be relevant: number of persons on board, amount of fuel remaining, possible presence of hazardous materials and the nature thereof; and
- f. notify the appropriate ATS units and authorities as specified in local instructions.

19.1.1.3 Changes of radio frequency and SSR code should be avoided if possible and should normally be made only when or if an improved service can be provided to the aircraft concerned. Manoeuvring instructions to an aircraft experiencing engine failure should be limited to a minimum. When appropriate, other aircraft operating in the vicinity of the aircraft in emergency should be advised of the circumstances.

Note. Requests to the flight crew for the information contained in 19.1.1.2 (e) will be made only if the information is not available from the operator or from other sources and will be limited to essential information.

19.1.2 Priority

An aircraft known or believed to be in a state of emergency, including being subjected to unlawful interference, shall be given priority over other aircraft.

19.1.3 Unlawful interference and aircraft bomb threat

19.1.3.1 Air traffic services personnel shall be prepared to recognize any indication of the occurrence of unlawful interference with an aircraft.

19.1.3.2 Whenever unlawful interference with an aircraft is suspected, and where automatic distinct display of SSR Mode A Code 7500 and Code 7700 is not provided, the radar controller shall attempt to verify any suspicion by setting the SSR decoder to Mode A Code 7500 and thereafter to Code 7700.

Note. An aircraft equipped with an SSR transponder is expected to operate the transponder on Mode A Code 7500 to indicate specifically that it is the subject of unlawful interference. The aircraft may operate the transponder on Mode A Code 7700, to indicate that it is threatened by grave and imminent danger and requires immediate assistance. An aircraft equipped with other surveillance system transmitters, including ADS-B and ADS-C, might send the emergency and/or urgency signal by all of the available means.

19.1.3.3 Whenever unlawful interference with an aircraft is known or suspected or a bomb threat warning has been received, ATS units shall promptly attend to requests by, or to anticipated needs of, the aircraft, including requests for relevant information relating to air navigation facilities, procedures and services along the route of flight and at any aerodrome of intended landing, and shall take such action as is necessary to expedite the conduct of all phases of the flight.

19.1.3.3.1 ATS units shall also:

- a. transmit, and continue to transmit, information pertinent to the safe conduct of the flight, without expecting a reply from the aircraft;**
- b. monitor and plot the progress of the flight with the means available, and coordinate transfer of control with adjacent ATS units without requiring transmissions or other responses from the aircraft, unless communication with the aircraft remains normal;**
- c. inform, and continue to keep informed, appropriate ATS units, including those in adjacent FIRs, which may be concerned with the progress of the flight;**

Note. In applying this provision, account must be taken of all the factors which may affect the progress of the flight, including fuel endurance and the possibility of sudden changes in route and destination. The objective is to provide, as far in advance as is practicable in the circumstances, each ATS unit with appropriate information as to the expected or possible penetration of the aircraft into its area of responsibility.

d. notify:

- 1. the operator or its designated representative;**
- 2. the appropriate rescue coordination centre in accordance with appropriate alerting procedures;**
- 3. the designated security authority;**

Note. It is assumed that the designated security authority and/or the operator will in turn notify other parties concerned in accordance with pre-established procedures.

e. relay appropriate messages, relating to the circumstances associated with the unlawful interference, between the aircraft and designated authorities.

Note. These messages include, but are not limited to: initial messages declaring an incident; update messages on an existing incident; messages containing decisions made by appropriate decision makers; messages on transfer of responsibility; messages on acceptance of responsibility; messages indicating that an entity is no longer involved in an incident; and messages closing an incident

19.1.3.4 The following additional procedures shall apply if a threat is received indicating that a bomb or other explosive device has been placed on board a known aircraft. The ATS unit receiving the threat information shall:

- a. if in direct communication with the aircraft, advise the flight crew without delay of the threat and the circumstances surrounding the threat; or**
- b. if not in direct communication with the aircraft, advise the flight crew by the most expeditious means through other ATS units or other channels.**

19.1.3.5 The ATS unit in communication with the aircraft shall ascertain the intentions of the flight crew and report those intentions to other ATS units which may be concerned with the flight.

19.1.3.6 The aircraft shall be handled in the most expeditious manner while ensuring, to the extent possible, the safety of other aircraft and that personnel and ground installations are not put at risk.

19.1.3.7 Aircraft in flight shall be given re-clearance to a requested new destination without delay. Any request by the flight crew to climb or descend for the purpose of equalizing or reducing the differential between the outside air pressure and the cabin air pressure shall be approved as soon as possible.

19.1.3.8 An aircraft on the ground should be advised to remain as far away from other aircraft and installations as possible and, if appropriate, to vacate the runway. The aircraft should be instructed to taxi to a designated or isolated parking area in accordance with local instructions. Should the flight crew disembark passengers and crew immediately, other aircraft, vehicles and personnel should be kept at a safe distance from the threatened aircraft.

19.1.3.9 ATS units shall not provide any advice or suggestions concerning action to be taken by the flight crew in relation to an explosive device.

19.1.3.10 An aircraft known or believed to be the subject of unlawful interference or which for other reasons needs isolation from normal aerodrome activities shall be cleared to the designated isolated parking position. Where such an isolated parking position has not been designated, or if the designated position is not available, the aircraft shall be cleared to a position within the area or areas selected by prior agreement with the aerodrome authority. The taxi clearance shall specify the taxi route to be followed to the parking position. This route shall be selected with a view to minimizing any security risks to the public, other aircraft and installations at the aerodrome.

19.1.4 Emergency descent

19.1.4.1 GENERAL

Upon receipt of advice that an aircraft is making an emergency descent through other traffic, all possible action shall be taken immediately to safeguard all aircraft concerned. When deemed necessary, air traffic control units shall immediately broadcast by means of the appropriate radio aids, or if not possible, request the appropriate communications stations immediately to broadcast an emergency message.

19.1.4.2 ACTION BY THE PILOT-IN-COMMAND

It is expected that aircraft receiving such a broadcast will clear the specified areas and stand by on the appropriate radio frequency for further clearances from the air traffic control unit.

19.1.4.3 SUBSEQUENT ACTION BY THE AIR TRAFFIC CONTROL UNIT

Immediately after such an emergency broadcast has been made the ACC, the approach control unit, or the aerodrome control tower concerned shall forward further clearances to all aircraft involved as to additional procedures to be followed during and subsequent to the emergency descent. The ATS unit concerned shall additionally inform any other ATS units and control sectors which may be affected.

19.2 SPECIAL PROCEDURES FOR IN-FLIGHT CONTINGENCIES IN OCEANIC AIRSPACE

19.2.1 Introduction

19.2.1.1 Although all possible contingencies cannot be covered, the procedures in 19.2.2 and 19.2.3 provide for the more frequent cases such as:

- a. inability to comply with assigned clearance due to meteorological conditions, aircraft performance or pressurization failure;
- b. en-route diversion across the prevailing traffic flow; and
- c. loss of, or significant reduction in, the required navigation capability when operating in an airspace where the navigation performance accuracy is a prerequisite to the safe conduct of flight operations.

19.2.1.2 With regard to 19.2.1.1 (a) and (b), the procedures are applicable primarily when rapid descent and/or turnback or diversion is required. The pilot shall take action as necessary to ensure the safety of the aircraft, and the pilot's judgement shall determine the sequence of actions to be taken, having regard to the prevailing circumstances. Air traffic control shall render all possible assistance.

19.2.2 General procedures

19.2.2.1 If an aircraft is unable to continue the flight in accordance with its ATC clearance, and/or an aircraft is unable to maintain the navigation performance accuracy specified for the airspace, a revised clearance shall be obtained, whenever possible, prior to initiating any action.

19.2.2.2 The radiotelephony distress signal (MAYDAY) or urgency signal (PAN PAN) preferably spoken three times shall be used as appropriate. Subsequent ATC action with respect to that aircraft shall be based on the intentions of the pilot and the overall air traffic situation.

19.2.2.3 If prior clearance cannot be obtained, until a revised clearance is received the following contingency procedures should be employed and the pilot shall advise air traffic control as soon as practicable, reminding them of the type of aircraft involved and the nature of the problem. In general terms, the aircraft should be flown at a flight level and on an offset track where other aircraft are least likely to be encountered. Specifically, the pilot shall:

- a. leave the assigned route or track by initially turning at least 45 degrees to the right or to the left, in order to acquire a same or opposite direction track offset 15 NM (28 km) from the assigned track centreline. When possible, the direction of the turn should be determined by the position of the aircraft relative to any organized route or track system. Other factors which may affect the direction of the turn are:
 - 1. the direction to an alternate airport;**
 - 2. terrain clearance;**
 - 3. any strategic lateral offset being flown; and**
 - 4. the flight levels allocated on adjacent routes or tracks;****
- b. having initiated the turn:
 - 1. if unable to maintain the assigned flight level, initially minimize the rate of descent to the extent that is operationally feasible (pilots should take into account the possibility that aircraft below on the same track may be flying a 1 or 2 NM strategic lateral offset procedure (SLOP)) and select a final altitude which differs from those normally used by 150 m (500 ft) if at or below FL 410, or by 300 m (1 000 ft) if above FL 410; or**
 - 2. if able to maintain the assigned flight level, once the aircraft has deviated 19 km (10 NM) from the assigned track centreline, climb or descend to select a flight level which differs from those normally used by 150 m (500 ft), if at or below FL 410, or by 300 m (1 000 ft) if above FL 410;****

- c. establish communications with and alert nearby aircraft by broadcasting, at suitable intervals on 121.5 MHz (or, as a backup, on the inter-pilot air-to-air frequency 123.45 MHz) and where appropriate on the frequency in use: aircraft identification, flight level, position (including the ATS route designator or the track code, as appropriate) and intentions;
- d. maintain a watch for conflicting traffic both visually and by reference to ACAS (if equipped);
- e. turn on all aircraft exterior lights (commensurate with appropriate operating limitations); and
- f. keep the SSR transponder on at all times; and

19.2.2.3.1 When leaving the assigned track :

- a. if the intention is to acquire a same direction offset track, the pilot should consider limiting the turn to a 45 degree heading change, in order not to overshoot the offset contingency track; or
- b. if the intention is to acquire and maintain an opposite direction offset track, then:
 - 1. operational limitations on bank angles at cruising altitudes will normally result in overshooting the track to be acquired. In such cases a continuous turn should be extended beyond 180 degrees heading change, in order to re-intercept the offset contingency track as soon as operationally feasible; and
 - 2. furthermore, if executing such a turnback in a 56 km (30 NM) lateral separation route structure, extreme caution pertaining to opposite direction traffic on adjacent routes must be exercised and any climb or descent, as specified in 19.2.2.3 b) 2), should be completed preferably before approaching within 19 km (10 NM) of any adjacent ATS route.

19.2.2.4 EXTENDED RANGE OPERATIONS BY AEROPLANES WITH TWO-TURBINE POWER-UNITS (ETOPS)

If the contingency procedures are employed by a twin-engine aircraft as a result of an engine shutdown or failure of an ETOPS critical system, the pilot should advise ATC as soon as practicable of the situation, reminding ATC of the type of aircraft involved, and request expeditious handling.

19.2.3 Weather deviation procedures

19.2.3.1 GENERAL

Note. The following procedures are intended for deviation around adverse meteorological conditions.

19.2.3.1.1 When the pilot initiates communications with ATC, a rapid response may be obtained by stating “WEATHER DEVIATION REQUIRED” to indicate that priority is desired on the frequency and for ATC response. When necessary, the pilot should initiate the communications using the urgency call “PAN PAN” (preferably spoken three times).

19.2.3.1.2 The pilot shall inform ATC when weather deviation is no longer required, or when a weather deviation has been completed and the aircraft has returned to its cleared route.

19.2.3.2 ACTIONS TO BE TAKEN WHEN CONTROLLER-PILOT COMMUNICATIONS ARE ESTABLISHED

19.2.3.2.1 The pilot should notify ATC and request clearance to deviate from track, advising, when possible, the extent of the deviation expected.

19.2.3.2.2 ATC should take one of the following actions:

- a. when appropriate separation can be applied, issue clearance to deviate from track; or
- b. if there is conflicting traffic and ATC is unable to establish appropriate separation, ATC shall:
 1. advise the pilot of inability to issue clearance for the requested deviation;
 2. advise the pilot of conflicting traffic; and
 3. request the pilot’s intentions.

19.2.3.2.3 The pilot should take the following actions:

- a. comply with the ATC clearance issued; or
- b. advise ATC of intentions and execute the procedures detailed in 19.2.3.3.

19.2.3.3 ACTIONS TO BE TAKEN IF A REVISED ATC CLEARANCE CANNOT BE OBTAINED

Note. The provisions of this section apply to situations where a pilot needs to exercise the authority of a pilot-in-command under the provisions of Chapter 6, 6.1.3 of this manual.

If the aircraft is required to deviate from track to avoid adverse meteorological conditions and prior clearance cannot be obtained, an ATC clearance shall be obtained at the earliest possible time. Until an ATC clearance is received, the pilot shall take the following actions:

- a. if possible, deviate away from an organized track or route system;**
- b. establish communications with and alert nearby aircraft by broadcasting, at suitable intervals: aircraft identification, flight level, position (including ATS route designator or the track code) and intentions, on the frequency in use and on 121.5 MHz (or, as a back-up, on the inter-pilot air-to-air frequency 123.45 MHz);**
- c. watch for conflicting traffic both visually and by reference to ACAS (if equipped);**

Note. If, as a result of actions taken under the provisions of 19.2.3.3.1 (b) and (c), the pilot determines that there is another aircraft at or near the same flight level with which a conflict may occur, then the pilot is expected to adjust the path of the aircraft, as necessary, to avoid conflict.

- d. turn on all aircraft exterior lights (commensurate with appropriate operating limitations);**
- e. for deviations of less than 19 km (10 NM) remain at a level assigned by ATC;**
- f. for deviations greater than 19 km (10 NM), when the aircraft is approximately 19 km (10 NM) from track, initiate a level change in accordance with Table 19 – 1;**

- g. when returning to track, be at its assigned flight level when the aircraft is within approximately 19 km (10 NM) of the centre line; and**
- h. if contact was not established prior to deviating, continue to attempt to contact ATC to obtain a clearance. If contact was established, continue to keep ATC advised of intentions and obtain essential traffic information.**

Table 19 - 1

Route centre line track	Deviation > 19 km (10 NM)	Level change
EAST 000° – 179° Magnetic	LEFT RIGHT	DESCEND 90 m (300 ft) CLIMB 90 m (300 ft)
WEST 180° – 359° magnetic	LEFT RIGHT	CLIMB 90 m (300 ft) DESCEND 90 m (300 ft)

19.2.4 Procedures for strategic lateral offsets in oceanic and remote continental airspace

Note 1. Annex 2, 3.6.2.1.1 requires authorization for the application of strategic lateral offsets from the appropriate ATS authority responsible for the airspace concerned.

Note 2. The following incorporates lateral offset procedures for both the mitigation of the increasing lateral overlap probability due to increased navigation accuracy, and wake turbulence encounters.

Note 3. The use of highly accurate navigation systems (such as the global navigation satellite system (GNSS)) by an increasing proportion of the aircraft population has had the effect of reducing the magnitude of lateral deviations from the route centre line and, consequently, increasing the probability of a collision, should a loss of vertical separation between aircraft on the same route occur.

19.2.4.1 The following shall be taken into account by the appropriate ATS authority when authorizing the use of strategic lateral offsets in a particular airspace:

- a. strategic lateral offsets shall only be authorized in en - route oceanic or remote continental airspace. Where part of the airspace in question is within radar coverage, transiting aircraft should normally be allowed to initiate or continue offset tracking;**
- b. strategic lateral offsets may be authorized for the following types of routes (including where routes or route systems intersect):**
 - 1. uni-directional and bi-directional routes; and**
 - 2. parallel route systems where the spacing between route centre lines is not less than 55.5 km (30 NM);**
- c. in some instances it may be necessary to impose restrictions on the use of strategic lateral offsets, e.g. where their application may be inappropriate for reasons related to obstacle clearance;**
- d. strategic lateral offset procedures should be implemented on a regional basis after coordination between all States involved;**
- e. the routes or airspace where application of strategic lateral offsets is authorized, and the procedures to be followed by pilots, shall be promulgated in aeronautical information publications (AIPs); and**
- f. air traffic controllers shall be made aware of the airspace within which strategic lateral offsets are authorized.**

19.2.4.1.1 The decision to apply a strategic lateral offset shall be the responsibility of the flight crew. The flight crew shall only apply strategic lateral offsets in airspace where such offsets have been authorized by the appropriate ATS authority and when the aircraft is equipped with automatic offset tracking capability.

19.2.4.1.2 The strategic lateral offset shall be established at a distance of 1.85 km (1 NM) or 3.7 km (2 NM) to the right of the centre line relative to the direction of flight.

Note 1. Pilots may contact other aircraft on the inter - pilot air -to- air frequency 123.45 MHz to coordinate offsets.

Note 2. The strategic lateral offset procedure has been designed to include offsets to mitigate the effects of wake turbulence of preceding aircraft. If wake turbulence needs to be avoided, one of the three available options (centre line, 1.85 km (1 NM) or 3.7 km (2 NM) right offset) may be used.

Note 3. Pilots are not required to inform ATC that a strategic lateral offset is being applied.

19.3 AIR-GROUND COMMUNICATIONS FAILURE

Note 1. Procedures to be applied in relation to an aircraft experiencing air-ground communication failure when providing ATS surveillance services are contained in Chapter 16, Section 16.10.3 of this manual.

Note 2. An aircraft equipped with an SSR transponder is expected to operate the transponder on Mode A Code 7600 to indicate that it has experienced air-ground communication failure. An aircraft equipped with other surveillance system transmitters, including ADS-B and ADS-C, might indicate the loss of air-ground communication by all of the available means.

19.3.1 Action by air traffic control units when unable to maintain two - way communication with an aircraft operating in a control area or control zone shall be as outlined in the paragraphs which follow.

19.3.2 As soon as it is known that two - way communication has failed, action shall be taken to ascertain whether the aircraft is able to receive transmissions from the air traffic control unit by requesting it to execute a specified manoeuvre which can be observed by radar or ADS-B or to transmit, if possible, a specified signal in order to indicate acknowledgement.

19.3.3 If the aircraft fails to indicate that it is able to receive and acknowledge transmissions, separation shall be maintained between the aircraft having the communication failure and other aircraft, based on the assumption that the aircraft will:

a. if in visual meteorological conditions:

1. continue to fly in visual meteorological conditions;

2. land at the nearest suitable aerodrome; and

3. report its arrival by the most expeditious means to the appropriate air traffic control unit; or

b. if in instrument meteorological conditions or when conditions are such that it does not appear likely that the pilot will complete the flight in accordance with (a):

1. unless otherwise prescribed on the basis of a regional air navigation agreement, in airspace where procedural separation is being applied, maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of 20 minutes following the aircraft's failure to report its position over a compulsory reporting point and thereafter adjust level and speed in accordance with the filed flight plan; or,

2. in airspace where an ATS surveillance system is used in the provision of air traffic control, maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of 7 minutes following:

i) the time the last assigned level or minimum flight altitude is reached; or

ii) the time the transponder is set to Code 7600 or the ADS-B transmitter is set to indicate the loss of air-ground communication; or

iii) the aircraft's failure to report its position over a compulsory reporting point; whichever is later and thereafter adjust level and speed in accordance with the filed flight plan;

3. when being vectored or having been directed by ATC to proceed offset using RNAV without a specified limit, proceed in the most direct manner possible to rejoin the current flight plan route no later than the next significant point, taking into consideration the applicable minimum flight altitude;
4. proceed according to the current flight plan route to the appropriate designated navigation aid or fix serving the destination aerodrome and, when required to ensure compliance with (5) below, hold over this aid or fix until commencement of descent;
5. commence descent from the navigation aid or fix specified in (4) at, or as close as possible to, the expected approach time last received and acknowledged; or, if no expected approach time has been received and acknowledged, at, or as close as possible to, the estimated time of arrival resulting from the current flight plan;
6. complete a normal instrument approach procedure as specified for the designated navigation aid or fix; and
7. land, if possible, within 30 minutes after the estimated time of arrival specified in (5) or the last acknowledged expected approach time, whichever is later.

Note 1. Provisions related to minimum levels are contained in Chapter 8, 8.1.3 of this manual.

Note 2. As evidenced by the meteorological conditions prescribed therein, 19.3.3 (a) relates to all controlled flights, whereas 19.3.3 (b) relates only to IFR flights.

19.3.4 Action taken to ensure suitable separation shall cease to be based on the assumption stated in 19.3.3 when:

- a. it is determined that the aircraft is following a procedure differing from that in 19.3.3; or

- b. through the use of electronic or other aids, air traffic control units determine that action differing from that required by 19.3.3 may be taken without impairing safety; or
- c. positive information is received that the aircraft has landed.

19.3.5 As soon as it is known that two – way communication has failed, appropriate information describing the action taken by the air traffic control unit, or instructions justified by any emergency situation, shall be transmitted blind for the attention of the aircraft concerned, on the frequencies available on which the aircraft is believed to be listening, including the voice frequencies of available radio navigation or approach aids. Information shall also be given concerning:

- a. meteorological conditions favourable to a cloud - breaking procedure in areas where congested traffic may be avoided; and
- b. meteorological conditions at suitable aerodromes.

19.3.6 Pertinent information shall be given to other aircraft in the vicinity of the presumed position of the aircraft experiencing the failure.

19.3.7 As soon as it is known that an aircraft which is operating in its area of responsibility is experiencing an apparent radiocommunication failure, an air traffic services unit shall forward information concerning the radiocommunication failure to all air traffic services units concerned along the route of flight. The ACC in whose area the destination aerodrome is located shall take steps to obtain information on the alternate aerodrome(s) and other relevant information specified in the filed flight plan, if such information is not available.

19.3.8 If circumstances indicate that a controlled flight experiencing a communication failure might proceed to (one of) the alternate aerodrome(s) specified in the filed flight plan, the air traffic control unit(s) serving the alternate aerodrome(s) and any other air traffic control units that might be affected by a possible diversion shall be informed of the circumstances of the failure and requested to attempt to establish communication with the aircraft at a time when the aircraft could possibly be within communication range. This shall apply particularly when, by agreement with the operator or a designated representative, a clearance has been transmitted blind to the aircraft concerned to proceed to an alternate aerodrome, or when meteorological conditions at the aerodrome of intended landing are such that a diversion to an alternate is considered likely.

19.3.9 When an air traffic control unit receives information that an aircraft, after Experiencing a communication failure has re-established communication or has landed, that unit shall inform the air traffic services unit in whose area the aircraft was operating at the time the failure occurred, and other air traffic services units concerned along the route of flight, giving necessary information for the continuation of control if the aircraft is continuing in flight.

19.3.10 If the aircraft has not reported within thirty minutes after:

- a. the estimated time of arrival furnished by the pilot;
- b. the estimated time of arrival calculated by the ACC; or
- c. the last acknowledged expected approach time,

whichever is latest, pertinent information concerning the aircraft shall be forwarded to aircraft operators, or their designated representatives, and pilots-in-command of any aircraft concerned and normal control resumed if they so desire. It is the responsibility of the aircraft operators, or their designated representatives, and pilots-in-command of aircraft to determine whether they will resume normal operations or take other action.

19.4 ASSISTANCE TO VFR FLIGHTS

19.4.1 Strayed VFR flights and VFR flights encountering adverse meteorological conditions

Note. A strayed aircraft is an aircraft which has deviated significantly from its intended track or which reports that it is lost.

19.4.1.1 A VFR flight reporting that it is uncertain of its position or lost, or encountering adverse meteorological conditions, should be considered to be in a state of emergency and handled as such. The controller shall, under such circumstances, communicate in a clear, concise and calm manner and care shall be taken, at this stage, not to question any fault or negligence that the pilot may have committed in the preparation or conduct of the flight. Depending on the circumstances, the pilot should be requested to provide any of the following information considered pertinent so as to better provide assistance:

- a. aircraft flight conditions;
- b. position (if known) and level;
- c. airspeed and heading since last known position, if pertinent;
- d. pilot experience;
- e. navigation equipment carried and if any navigation aid signals are being received;
- f. SSR Mode and code selected if relevant;
- g. departure and destination aerodromes;
- h. number of persons on board;
- i. endurance.

19.4.1.2 If communications with the aircraft are weak or distorted, it should be suggested that the aircraft climb to a higher level, provided meteorological conditions and other circumstances permit.

19.4.1.3 Navigation assistance to help the pilot determine the aircraft position may be provided by use of ATS surveillance system, direction-finder, navigation aids or sighting by another aircraft. Care must be taken when providing navigation assistance to ensure that the aircraft does not enter cloud.

Note. The possibility of a VFR flight becoming strayed as a result of encountering adverse meteorological conditions must be recognized.

19.4.1.4 The pilot should be provided with reports and information on suitable aerodromes in the vicinity where visual meteorological conditions exist.

19.4.1.5 If reporting difficulty in maintaining or unable to maintain VMC, the pilot should be informed of the minimum flight altitude of the area where the aircraft is, or is believed to be. If the aircraft is below that level, and the position of the aircraft has been established with a sufficient degree of probability, a track or heading, or a climb, may be suggested to bring the aircraft to a safe level.

19.4.1.6 Assistance to a VFR flight should only be provided using an ATS surveillance system upon the request or concurrence of the pilot. The type of radar service to be provided should be agreed with the pilot.

19.4.1.7 When providing such assistance in adverse meteorological conditions, the primary objective should be to bring the aircraft into VMC as soon as possible. Caution must be exercised to prevent the aircraft from entering cloud.

19.4.1.8 Should circumstances be such that IMC cannot be avoided by the pilot, the following guidelines may be followed:

- a. other traffic on the ATC frequency not able to provide any assistance may be instructed to change to another frequency to ensure uninterrupted communications with the aircraft; alternatively the aircraft being assisted may be instructed to change to another frequency;
- b. ensure, if possible, that any turns by the aircraft are carried out clear of cloud;
- c. instructions involving abrupt manoeuvres should be avoided; and
- d. instructions or suggestions to reduce speed of the aircraft or to lower the landing gear, should, if possible, be carried out clear of cloud.

19.5 OTHER IN-FLIGHT CONTINGENCIES

Note. The texts of 19.5.1 and 19.5.2 are reproduced from Annex 11, Chapter 2 and have the status of Standards.

19.5.1 Strayed or unidentified aircraft

Note 1. The terms “strayed aircraft” and “unidentified aircraft” in this paragraph have the following meanings:

Strayed aircraft : An aircraft which has deviated significantly from its intended track or which reports that it is lost.

Unidentified aircraft: An aircraft which has been observed or reported to be operating in a given area but whose identity has not been established.

Note 2. An aircraft may be considered, at the same time, as a “strayed aircraft” by one unit and as an “unidentified aircraft” by another unit.

Note 3. A strayed or unidentified aircraft may be suspected as being the subject of unlawful interference. See Annex 11, 2.24.1.3.

19.5.1.1 As soon as an air traffic services unit becomes aware of a strayed aircraft, it shall take all necessary steps as outlined in 19.5.1.1.1 and 19.5.1.1.2 to assist the aircraft and to safeguard its flight.

Note. Navigational assistance by an air traffic services unit is particularly important. If the unit becomes aware of an aircraft straying, or about to stray, into an area where there is a risk of interception or other hazard to its safety.

19.5.1.1.1 If the aircraft’s position is not known, the air traffic services unit shall:

- a. attempt to establish two-way communication with the aircraft, unless such communication already exists;**
- b. use all available means to determine its position;**
- c. inform other ATS units into whose area the aircraft may have strayed or may stray, taking into account all the factors which may have affected the navigation of the aircraft in the circumstances;**
- d. inform, in accordance with locally agreed procedures, appropriate military units and provide them with pertinent flight plan and other data concerning the strayed aircraft;**
- e. request from the units referred to in c) and d) and from other aircraft in flight every assistance in establishing communication with the aircraft and determining its position.**

Note. The requirements in (d) and (e) above apply also to ATS units informed in accordance with (c) above.

19.5.1.1.2 When the aircraft’s position is established, the air traffic services unit shall:

- a. advise the aircraft of its position and corrective action to be taken; and**

- b. provide, as necessary, other ATS units and appropriate military units with relevant information concerning the strayed aircraft and any advice given to that aircraft.

19.5.1.2 As soon as an air traffic services unit becomes aware of an unidentified aircraft in its area, it shall endeavour to establish the identity of the aircraft whenever this is necessary for the provision of air traffic services or required by the appropriate military authorities in accordance with locally agreed procedures. To this end, the air traffic services unit shall take such of the following steps as are appropriate in the circumstances:

- a. attempt to establish two-way communication with the aircraft;
- b. inquire of other air traffic services units within the FIR about the flight and request their assistance in establishing two-way communication with the aircraft;
- c. inquire of air traffic services units serving the adjacent FIRs about the flight and request their assistance in establishing two-way communication with the aircraft;
- d. attempt to obtain information from other aircraft in the area.

19.5.1.2.1 The air traffic services unit shall, as necessary, inform the appropriate military unit as soon as the identity of the aircraft has been established.

Note. Requirements for coordination between military authorities and air traffic services are specified in Annex 11, 2.16.

19.5.1.3 Should the ATS unit consider that a strayed or unidentified aircraft may be the subject of unlawful interference, the appropriate authority designated by the State shall immediately be informed, in accordance with locally agreed procedures.

19.5.2 Interception of civil aircraft

19.5.2.1 As soon as an air traffic services unit learns that an aircraft is being intercepted in its area of responsibility, it shall take such of the following steps as are appropriate in the circumstances:

- a. attempt to establish two-way communication with the intercepted aircraft on via any means available , including the emergency frequency 121.5 MHz, unless such communication already exists;
- b. inform the pilot of the intercepted aircraft of the interception;
- c. establish contact with the intercept control unit maintaining two-way communication with the intercepting aircraft and provide it with available information concerning the aircraft;
- d. relay messages between the intercepting aircraft or the intercept control unit and the intercepted aircraft, as necessary;
- e. in close coordination with the intercept control unit take all necessary steps to ensure the safety of the intercepted aircraft; and
- f. inform ATS units serving adjacent FIRs if it appears that the aircraft has strayed from such adjacent FIRs.

19.5.2.2 As soon as an air traffic services unit learns that an aircraft is being intercepted outside its area of responsibility, it shall take such of the following steps as are appropriate in the circumstances:

- a. inform the ATS unit serving the airspace in which the interception is taking place, providing this unit with available information that will assist in identifying the aircraft and requesting it to take action in accordance with 19.5.2.1;
- b. relay messages between the intercepted aircraft and the appropriate ATS unit, the intercept control unit or the intercepting aircraft.

19.5.3 Fuel dumping

19.5.3.1 GENERAL

19.5.3.1.1 An aircraft in an emergency or other urgent situations may need to dump fuel so as to reduce to maximum landing mass in order to effect a safe landing.

19.5.3.1.2 When an aircraft operating within controlled airspace needs to dump fuel, the flight crew shall advise ATC. The ATC unit should then coordinate with the flight crew the following:

- a. the route to be flown, which, if possible, should be clear of cities and towns, preferably over water and away from areas where thunderstorms have been reported or are expected;
- b. the level to be used, which should be not less than 1 800 m (6 000 ft); and
- c. the duration of the fuel dumping.

19.5.3.2 SEPARATION

Other known traffic should be separated from the aircraft dumping fuel by:

- a. at least 19 km (10 NM) horizontally, but not behind the aircraft dumping fuel;
- b. vertical separation if behind the aircraft dumping fuel within 15 minutes flying time or a distance of 93 km (50 NM) by;
 1. at least 300 m (1 000 ft) if above the aircraft dumping fuel; and
 2. at least 900 m (3 000 ft) if below the aircraft dumping fuel.

Note. The horizontal boundaries of the area within which other traffic requires appropriate vertical separation extend for 19 km (10 NM) either side of the track flown by the aircraft which is dumping fuel, from 19 km (10 NM) ahead, to 93 km (50 NM) or 15 minutes along track behind it (including turns).

19.5.3.3 COMMUNICATIONS

If the aircraft will maintain radio silence during the fuel dumping operation, the frequency to be monitored by the flight crew and the time when radio silence will terminate should be agreed.

19.5.3.4 INFORMATION TO OTHER ATS UNITS AND NON-CONTROLLED TRAFFIC

19.5.3.4.1 A warning message shall be broadcast on appropriate frequencies for non - controlled traffic to remain clear of the area concerned. Adjacent ATC units and control sectors should be informed of the fuel dumping taking place and requested to broadcast on applicable frequencies an appropriate warning message for other traffic to remain clear of the area concerned.

19.5.3.4.2 Upon completion of the fuel dumping, adjacent ATC units and control sectors should be advised that normal operations can be resumed.

19.5.4 Descents by supersonic aircraft due to solar cosmic radiation

Air traffic control units should be prepared for the possibility that supersonic aircraft operating at levels above 15 000 m (49 000 ft) may, on rare occasions, experience a rise in solar cosmic radiation which requires them to descend to lower levels, possibly down to or below the levels being used by subsonic aircraft. When such a situation is known or suspected, air traffic control units should take all possible action to safeguard all aircraft concerned, including any subsonic aircraft affected by the descent.

Note. All supersonic aircraft in a particular portion of airspace will be affected at the same time, and the event may be accompanied by a deterioration or loss of air-ground communications. It is expected that the aircraft will alert air traffic control units before the radiation reaches a critical level and will request a descent clearance when the critical level is reached. However, situations may occur in which the aircraft will need to descend without waiting for a clearance. In such cases, the aircraft are expected to advise air traffic control units, as soon as possible, of the emergency action taken.

19.6 ATC CONTINGENCIES

The various circumstances surrounding each contingency situation preclude the establishment of exact detailed procedures to be followed. The procedures outlined below are intended as a general guide to air traffic services personnel.

19.6.1 RADIO COMMUNICATIONS CONTINGENCIES

19.6.1.1 GENERAL

ATC contingencies related to communications, i.e. circumstances preventing a controller from communicating with aircraft under control, may be caused by either a failure of ground radio equipment, a failure of airborne equipment, or by the control frequency being inadvertently blocked by an aircraft transmitter. The duration of such events may be for prolonged periods and appropriate action to ensure that the safety of aircraft is not affected should therefore be taken immediately.

19.6.1.2 GROUND RADIO FAILURE

19.6.1.2.1 In the event of complete failure of the ground radio equipment used for ATC, the controller shall:

- a. where aircraft are required to keep a listening watch on the emergency frequency 121.5 MHz, attempt to establish radiocommunications on that frequency;**
- b. without delay inform all adjacent control positions or ATC units, as applicable, of the failure;**
- c. appraise such positions or units of the current traffic situation;**
- d. if practicable, request their assistance, in respect of aircraft which may establish communications with those positions or units, in establishing separation between and maintaining control of such aircraft; and**
- e. instruct adjacent control positions or ATC units to hold or reroute all controlled flights outside the area of responsibility of the position or ATC unit that has experienced the failure until such time that the provision of normal services can be resumed.**

19.6.1.2.2 In order to reduce the impact of complete ground radio equipment failure on the safety of air traffic, the appropriate ATS authority should establish contingency procedures to be followed by control positions and ATC units in the event of such failures. Where feasible and practicable, such contingency procedures should provide for the delegation of control to an adjacent control position or ATC unit in order to permit a minimum level of services to be provided as soon as possible, following the ground radio failure and until normal operations can be resumed.

19.6.1.3 BLOCKED FREQUENCY

In the event that the control frequency is inadvertently blocked by an aircraft transmitter, the following additional steps should be taken:

- a. attempt to identify the aircraft concerned
- b. if the aircraft blocking the frequency is identified, attempts should be made to establish communication with that aircraft, e.g. on the emergency frequency 121.5 MHz, by SELCAL, through the aircraft operator's company frequency if applicable, on any VHF frequency designated for air-to-air use by flight crews or any other communication means or, if the aircraft is on the ground, by direct contact;
- c. if communication is established with the aircraft concerned, the flight crew shall be instructed to take immediate action to stop inadvertent transmissions on the affected control frequency.

19.6.1.4 UNAUTHORIZED USE OF ATC FREQUENCY

19.6.1.4.1 Instances of false and deceptive transmissions on ATC frequencies which may impair the safety of aircraft can occasionally occur. In the event of such occurrences, the ATC unit concerned should:

- a. correct any false or deceptive instructions or clearances which have been transmitted;
- b. advise all aircraft on the affected frequency(-ies) that false and deceptive instructions or clearances are being transmitted;

- c. instruct all aircraft on the affected frequency(ies) to verify instructions and clearances before taking action to comply;
- d. if practical, instruct aircraft to change to another frequency; and
- e. if possible, advise all aircraft affected when the false and deceptive instructions or clearances are no longer being transmitted.

19.6.1.4.2 Flight crews shall challenge or verify with the ATC unit concerned any instruction or clearance issued to them which they suspect may be false or deceptive.

19.6.1.4.3 When the transmission of false or deceptive instructions and clearances is detected, the appropriate authority shall take all necessary action to have the transmitter located and the transmission terminated.

19.7 OTHER ATC CONTINGENCY PROCEDURES

19.7.1 Emergency separation

19.7.1.1 If, during an emergency situation, it is not possible to ensure that the applicable horizontal separation can be maintained, emergency separation of half the applicable vertical separation minimum may be used, i.e. 150 m (500 ft) between aircraft in airspace where a vertical separation minimum of 300 m (1 000 ft) is applied, and 300 m (1 000 ft) between aircraft in airspace where a 600 m (2 000 ft) vertical separation minimum is applied.

19.7.1.2 When emergency separation is applied the flight crews concerned shall be advised that emergency separation is being applied and informed of the actual minimum used. Additionally, all flight crews concerned shall be provided with essential traffic information.

19.7.2 Short-Term Conflict Alert (STCA) procedures

Note 1. The generation of short-term conflict alerts is a function based on surveillance data, integrated into an ATC system. The objective of the STCA function is to assist the controller in preventing collision between aircraft by generating, in a timely manner, an alert of a potential or actual infringement of separation minima.

Note 2. In the STCA function the current and predicted three dimensional positions of aircraft with pressure-altitude reporting capability are monitored for proximity. If the distance between the three-dimensional positions of two aircraft is predicted to be reduced to less than the defined applicable separation minima within a specified time period, an acoustic and/or visual alert will be generated to the controller within whose jurisdiction area the aircraft is operating.

19.7.2.1 Local instructions concerning use of the STCA function shall specify, *inter alia*:

- a. the types of flight which are eligible for generation of alerts;**
- b. the sectors or areas of airspace within which the STCA function is implemented;**
- c. the method of displaying the STCA to the controller;**
- d. in general terms, the parameters for generation of alerts as well as alert warning time;**
- e. the volumes of airspace within which STCA can be selectively inhibited and the conditions under which this will be permitted;**
- f. conditions under which specific alerts may be inhibited for individual flights; and**
- g. procedures applicable in respect of volume of airspace or flights for which STCA or specific alerts have been inhibited.**

19.7.2.2 In the event an STCA is generated in respect of controlled flights, the controller shall without delay assess the situation and, if necessary, take action to ensure that the applicable separation minimum will not be infringed or will be restored.

19.7.2.3 Following the generation of an STCA, controllers should be required to complete an air traffic incident report only in the event that a separation minimum was infringed.

19.7.2.4 The appropriate ATS authority should retain electronic records of all alerts generated. The data and circumstances pertaining to each alert should be analysed to determine whether an alert was justified or not. Non-justified alerts, e.g. when visual separation was applied, should be ignored. A statistical analysis should be made of justified alerts in order to identify possible shortcomings in airspace design and ATC procedures as well as to monitor overall safety levels.

19.7.3 Procedures in regard to aircraft equipped with Airborne Collision Avoidance Systems (ACAS)

19.7.3.1 The procedures to be applied for the provision of air traffic services to aircraft equipped with ACAS shall be identical to those applicable to non-ACAS equipped aircraft. In particular, the prevention of collisions, the establishment of appropriate separation and the information which might be provided in relation to conflicting traffic and to possible avoiding action shall conform with the normal ATS procedures and shall exclude consideration of aircraft capabilities dependent on ACAS equipment.

19.7.3.2 When a pilot reports an ACAS resolution advisory (RA), the controller shall not attempt to modify the aircraft flight path until the pilot reports “Clear Of Conflict”

19.7.3.3 Once an aircraft departs from its ATC clearance or instructions in compliance with an RA, or a pilot reports an RA, the controller ceases to be responsible for providing separation between that aircraft and any other aircraft affected as a direct consequence of the manoeuvre induced by the RA. The controller shall resume responsibility for providing separation for all the affected aircraft when:

- a. the controller acknowledges a report from the flight crew that the aircraft has resumed the current clearance; or
- b. the controller acknowledges a report from the flight crew that the aircraft is resuming the current clearance and issues an alternative clearance which is acknowledged by the flight crew.

Note. Pilots are required to report RAs which require a deviation from the current ATC clearance or instruction (see PANS-OPS (Doc 8168), Volume I, Part III, Section 3, Chapter 3, 3.2 c) 4)). This report informs the controller that a deviation from clearance or instruction is taking place in response to an ACAS RA.

19.7.3.4 Guidance on training of air traffic controllers in the application of ACAS events is contained in the *Airborne Collision Avoidance System (ACAS) Manual (Doc 9863)*.

19.7.3.5 ACAS can have a significant effect on ATC. Therefore, the performance of ACAS in the ATC environment should be monitored.

19.7.3.6 Following a significant ACAS event, pilots and controllers should complete an air traffic incident report.

Note 1. The ACAS capability of an aircraft may not be known to air traffic controllers.

Note 2. Operating procedures for use of ACAS are contained in PANS-OPS (Doc 8168), Volume I, Part VIII, Section 3, Chapter 3.

19.7.4 Minimum Safe Altitude Warning (MSAW) procedures

Note 1. The generation of minimum safe altitude warnings is a function of an ATC radar data-processing system. The objective of the MSAW function is to assist in the prevention of controlled flight into terrain accidents by generating, in a timely manner, a warning of the possible infringement of a minimum safe altitude.

Note 2. In the MSAW function, the reported levels from aircraft with pressure-altitude reporting capability are monitored against defined minimum safe altitudes. When the level of an aircraft is detected or predicted to be less than the applicable minimum safe altitude, an acoustic and visual warning will be generated to the controller within whose jurisdiction area the aircraft is operating.

19.7.4.1 Local instructions concerning use of the MSAW function shall specify, *inter alia*:

- a. the types of flight which are eligible for generation of MSAW;
- b. the sectors or areas of airspace for which MSAW minimum safe altitudes have been defined and within which the MSAW function is implemented;
- c. the values of the defined MSAW minimum safe altitudes;
- d. the method of displaying the MSAW to the controller;
- e. the parameters for generation of MSAW as well as warning time; and
- f. conditions under which the MSAW function may be inhibited for individual aircraft tracks as well as procedures applicable in respect of flights for which MSAW has been inhibited.

19.7.4.2 In the event an MSAW is generated in respect of a controlled flight, the following action shall be taken without delay:

- a. if the aircraft is being vectored, the aircraft shall be instructed to climb immediately to the applicable safe level and, if necessary to avoid terrain, be assigned a new heading;
- b. in other cases, the flight crew shall immediately be advised that a minimum safe altitude warning has been generated and be instructed to check the level of the aircraft.

19.7.4.3 Following an MSAW event, controllers should complete an air traffic incident report only in the event that a minimum safe altitude was unintentionally infringed with a potential for controlled flight into terrain by the aircraft concerned.

19.7.5 Change of radiotelephony call sign for aircraft

19.7.5.1 An ATC unit may instruct an aircraft to change its type of RTF call sign, in the interests of safety, when similarity between two or more aircraft RTF call signs are such that confusion is likely to occur.

19.7.5.1.1 Any such change to the type of call sign shall be temporary and shall be applicable only within the airspace(s) where the confusion is likely to occur.

19.7.5.2 To avoid confusion, the ATC unit should, if appropriate, identify the aircraft which will be instructed to change its call sign by referring to its position and/or level.

19.7.5.3 When an ATC unit changes the type of call sign of an aircraft, that unit shall ensure that the aircraft reverts to the call sign indicated by the flight plan when the aircraft is transferred to another ATC unit, except when the call sign change has been coordinated between the two ATC units concerned.

19.7.5.4 The appropriate ATC unit shall advise the aircraft concerned when it is to revert to the call sign indicated by the flight plan.

E N D