PART 4 : SECTION 3

CHAPTER 1

DISTRESS ACTION AND CREW DRILLS

Introduction

1. The chapters in this section should be read in conjunction with the emergency procedures laid down in A.P.3322 (Supplementary Flight Information Document) and with Part 2, Sect. 4, Chap. 15, of this volume.

2. If circumstances arise which necessitate a forced landing on land or water or the abandoning of an aircraft by parachute, immediate and almost automatic execution of the correct drills is essential.

3. Emergency drills are evolved in order to avoid panic and to ensure the quick, safe exit of personnel with all necessary rescue aids and survival equipment from a distressed aircraft ; they should set out clearly the duties of every individual in the aircraft, whether crew member or passenger. Drills must be practised regularly so that they become automatic. It has been proved beyond doubt that automatic and instant response founded on efficient drill has been responsible for the saving of life in many incidents. In practice drills the simulation of injury by one or more crew members has proved a valuable aid to training. It is the aim of this chapter to set out the basic essentials of the drills for abandoning aircraft, crash landing, and ditching.

Signals Action in an Emergency. (See also Part 2, Sect. 4, Chap. 15, paras. 9 to 12)

4. **States of Emergency.** There are three states of emergency, termed safety, urgency, and distress.

(*a*) *Safety*. This is the state existing in bad weather, or when the crew are uncertain of their position, or under similar potentially dangerous conditions.

(*b*) *Urgency*. An aircraft is said to be in a state of urgency when it is in urgent need of assistance to extricate it from a dangerous situation, *e.g.* aircraft lost, fuel shortage, partial engine failure, etc.

(*c*) *Distress*. An aircraft is said to be in distress when it is in serious and imminent danger and in need of immediate assistance, *e.g.* ditching, crash landing, or baling out.

5. The signals action to be taken will always be appropriate to the state of emergency existing. There is, however, one guiding principle common to all states of emergency ; *i.e.* if there is any danger, however slight, or any likelihood of danger, *a ground station should be immediately informed.* An unnecessary signal can (and should) always be cancelled, but deferred signals action may result in the disappearance of an aircraft without trace. There is a definite signals procedure appropriate to each of the three states of emergency, detailed in the following paragraphs.

6. **Safety—Signals Action.** Transmit the international safety signal "Securité" (pronounced SAY-CURI-TAY) three times by R/T, or "TTT" three times by W/T, followed by particulars of the navigational or meteorological circumstances. In addition, the safety message is to contain as much of the following information as can be supplied :—

(*a*) Estimated position and time established.

(*b*) Heading.

(*c*) I.A.S.

(*d*) Altitude.

(*e*) Nature of assistance required.

7. Safety and urgency signals should always be addressed to the nearest ground station and preferably to an air traffic control centre. If there is any doubt as to the nearest ground station, the transmission should be addressed to "All stations".

8. **Urgency—Signals Action.** Transmit the international urgency signal "Pan" three times by R/T, or "XXX" three times by W/T, on the frequency in use, followed by the information detailed below :—

(*a*) Estimated position and time established.

(*b*) Heading.

(*c*) I.A.S.

(*d*) Altitude.

(*e*) Type of aircraft.

(*f*) Nature of danger and assistance required.

(*g*) Intention of aircraft captain.

(*h*) Endurance (in hours and minutes).

The transmission should be repeated on the M/F, H/F, and V.H.F. emergency frequencies. If no contact is established with any ground station, or if doubt exists as to which ground station should be called, the transmission should be made on the V.H.F. international distress frequency, *i.e.* 121·5 mc/s on R/T (or 500 kc/s on W/T). If for any reason (*e.g.* radio failure) it is necessary to make pyrotechnic and/or visual signals to indicate urgency, the landing or navigation lights should be switched on and off at *irregular* intervals, or a succession of white Very lights fired.

9. **Distress—Signals Action.** If automatic emergency equipment (*e.g.* I.F.F.) is provided it should be switched on and the distress call, followed by the distress message, transmitted *on the frequency in use*, as detailed in sub-paras. (*a*) and (*b*). The distress message should follow as quickly as possible after the distress call, since ground stations do not answer a distress call but listen out for the distress message which is expected to follow it. The distress call and message should be repeated on the V.H.F., M/F, and H/F emergency frequencies.

(*a*) *Distress Call.*

(i) "Mayday, Mayday, Mayday" on R/T; or "SOS, SOS, SOS" on W/T.

(ii) "This is" (on R/T), or "DE" (on W/T).

(iii) The aircraft callsign should then be transmitted three times.

(*b*) *Distress Message.*

(i) "Mayday, Mayday, Mayday" on R/T; or "SOS, SOS, SOS" on W/T.

(ii) "This is" (on R/T), or "DE" (on W/T).

(iii) The aircraft callsign should then be transmitted three times, followed by the text of the message, which should include as much of the information detailed in para. 8 (*a*) to (*g*) as time permits. This should be followed by two periods, each of about ten seconds' duration, during which the transmitting button should be depressed, or (if the transmission is by W/T) by two dashes, each of about ten seconds' duration.

(iv) The aircraft callsign should then be transmitted once, followed (on R/T) by the word "Over", or (on W/T) by the letter "K".

(*c*) *Action if the Distress Message is Not Acknowledged.* If the distress message is not acknowledged, the distress call and message should be broadcast on the international distress frequency. When an aircraft is forced down on land and all normal distress procedures have failed, a call may be made on the W/T frequency within the amateur band, 7,000 to 7,150 kc/s.

(*d*) *Action when Ditching, Crash Landing, or Baling Out.* When ditching, crash landing, or baling out is inevitable, the aircraft callsign should be transmitted and the R/T remote control switch (if fitted) turned to the transmit position, or (with W/T) the morse key should be clamped down.

(*e*) *International Visual Distress Signals.* If it is necessary to use pyrotechnics for signalling distress, parachute flares showing a red light, or one or more red Very lights should be used.

10. **Cancellation of Emergency Signals.** It is essential that Safety, Urgency, and Distress messages should be cancelled if the emergency ceases to exist. The cancellation should be made on all frequencies on which the original message was dispatched, and should be amplified by an explanatory message.

Crash Landing and Ditching Stations

11. Approved crash landing and ditching stations are decided upon for all types of aircraft, the following main points being borne in mind :—

(*a*) The parts of the airframe that are safest and strongest.

(*b*) The parts of the airframe that are weakest and likely to break off or crumple on impact.

(*c*) The position of escape exits.

(*d*) The likely places for severe inrush of water (in ditching cases only).

(*e*) The presence of projections likely to cause injury.

(*f*) The position of equipment which may become dislodged easily.

(*g*) An aft facing position is always preferable to a forward facing one.

(*h*) The crew members detailed to open or jettison escape hatches.

(*j*) The even distribution of essential duties such as warning passengers, closing bulkhead doors, etc.

(*k*) The method to be adopted in removing and taking out of the aircraft the internally stowed emergency equipment and the allocation of this responsibility among the crew members. Similar considerations apply to any externally stowed emergency equipment.

(*l*) The order of leaving the aircraft, allocating the use of escape hatches as equally as possible.

(*m*) In ditching cases only, the crew members detailed to operate the dinghy manual release or launch the valise dinghy.

12. Crash landing and ditching stations seldom differ, but occasionally slight changes have to be made for the reason given in para. 11 (*d*).

Examples of Crash Landing and Ditching Stations

13. In aft-facing crew or passenger seats with safety harness secured, the feet should be braced against suitable supports, with the hands holding or braced against parts of the aircraft structure; the head should be braced against the back of the seat. If the back of the seat does not provide this support, the head should be clasped and braced in the hands, with the fingers firmly interlocked behind the head.

14. An alternative position is for some crew members and/or passengers to be seated on the floor facing aft, with their backs against suitable supporting surfaces, *e.g.* a main spar or bulkhead. The feet should be braced against suitable supports and the head clasped and braced in the hands, the fingers being firmly interlocked behind the head. A variation is to have a second person adopt a similar position supported by the knees of the first person. This attitude should also be used on some types of transport and troop-carrying aircraft, where webbing straps about two feet wide are provided for fastening across the fuselage immediately prior to crash landing or ditching to afford the necessary back support.

15. Another alternative position is to lie on the fuselage floor, face upwards, with the feet forward against a fixed portion of the aircraft structure, the knees flexed, and the hands gripping suitable handholds. A development is to have two people lying on their backs side by side, each with one arm round the neck of the other, and the free hand holding a suitable handhold in the aircraft structure.

16. When seated in forward-facing seats with the safety harness secured, the feet should be braced against suitable supports, with the hands holding or braced against parts of the aircraft structure. Whenever possible, when using this position, the head should be braced with one arm across the forehead, and the hand gripping a suitable handhold or other part of the aircraft structure.

Proceedure to be Adopted when Crash Landing or Ditching

17. **Warning of Crew and Passengers.** The captain should pass the preliminary warning immediately an emergency arises, followed when necessary by the executive order over the intercom for crash landing or ditching, *i.e.* "Prepare for crash landing" or "Dinghy prepare for ditching". If there is insufficient time for preparation, the captain should add to this order "Take immediate crash landing stations" or "Take immediate ditching stations".

18. The intercom message should be duplicated on the call light and/or warning horn—"CCC" for crash landing, "DDD" for ditching—and the crew member nearest to the wireless operator should give him verbal warning in case he has not received the captain's warning. In passenger-carrying aircraft, at least one crew member should inform the passengers and also assist them to take up their crash-landing or ditching stations.

19. **Captain—Immediate Action.**

(*a*) Warns crew. States intention.

(*b*) Takes the appropriate distress action.

(*c*) Prepares the aircraft for crash landing or ditching.

(*d*) Secures his safety harness and ensures that his personal safety equipment is in order.

(*e*) Ensures that the appropriate distress action is being taken, and that the rest of the crew are carrying out their allotted duties and are taking up their ditching and/or crash landing stations.

(*f*) Keeps the crew informed of the aircraft's height and any other relevant information.

(*g*) Orders the wireless operator to his crash landing or ditching station. The wireless operator should remain at his set for as long as possible and be the last to take up his emergency station.

(*h*) Jettisons the hood on single-seat aircraft.

(*j*) Just before the touch-down, warns the crew to brace.

(*k*) When the aircraft has come to rest, releases his safety and parachute harnesses and leaves the aircraft through the allotted hatch, taking with him, after ditching, the correct items of survival kit. After crash landing, he should leave the aircraft as quickly as possible owing to the fire risk. When the fire risk has passed, he should return and collect all useful kit and equipment.

20. Captains of aircraft must appreciate that emergency signals should be made as early as possible to enable the greatest measure of assistance to be given to the aircraft. Radio transmissions should, therefore, be commenced as soon as the captain has reason to believe he may have to ditch, or to crash land in territory where the necessity for rescue will arise.

21. **Navigator—Immediate Actions.** On receipt of the captain's warning the navigator should :—

(*a*) Determine the aircraft's position.

(*b*) Pass this position to the wireless operator together with the true heading of the aircraft, altitude, and a short weather report, including if possible visibility and (if ditching) the state of the water.

(*c*) Pass the estimated position of crash landing or ditching to the wireless operator.

(*d*) Inform the captain of the surface wind velocity.

(*e*) Destroy secret papers. Place charts, with latest positions marked, in a satchel ready to take out of the aircraft.

(*f*) Carry out any further duties as set out in the drill, *e.g.* jettison the appropriate escape hatches, ensure that the bomb doors are closed, etc.

(*g*) Take up his crash-landing or ditching station.

(*h*) Brace when ordered.

(*j*) Leave the aircraft when it has come to rest through the allotted escape hatch, taking with him, after ditching, the items of survival kit for which he is responsible. After crash landing, leave the aircraft as quickly as possible owing to the fire risk. If there is no fire, return and collect all useful kit and equipment.

22. **Wireless Operator—Immediate Action.** On receipt of the warning he should :—

(*a*) Take the appropriate distress action.

(*b*) Turn the I.F.F. to emergency.

(*c*) Pass any fixes and bearings received to the navigator.

(*d*) Transmit the estimated position of crash landing or ditching given by the navigator.

(*e*) Destroy secret papers.

(*f*) On the captain's order, take up his crash landing or ditching station, after clamping the morse key.

(*g*) Brace when ordered.

(*h*) Leave the aircraft when it has come to rest, through the allotted escape hatch, taking with him, after ditching, the items of survival kit for which he is responsible. After crash landing, he should leave the aircraft as quickly as possible owing to the fire risk. If there is no fire, he should return and collect all useful kit and equipment.

23. **Remainder of Crew—Immediate Actions.** The actions of the remainder of a crew do not involve similar technical responsibilities to those of the pilot, navigator, and wireless operator. Nevertheless, they may be required to assist in other respects, for example :—

(*a*) One member, usually the second pilot or engineer, should help the captain to secure his safety harness, attach his single-seat-type dinghy, if applicable, and be of general assistance to him.

(*b*) One or more members should jettison the appropriate upper or side hatches and, if ditching, should check the security of the lower hatches.

(*c*) One member should check that the survival equipment is available for immediate removal and that all loose items of equipment are properly stowed.

(*d*) In passenger-carrying aircraft, at least one member should ensure that the passengers carry out their correct drill.

(*e*) Assist in jettisoning equipment.

(*f*) Take up crash landing or ditching stations as soon as possible after essential duties have been carried out.

(*g*) Brace when ordered.

(*h*) After ditching, leave the aircraft through the allotted escape hatch with the correct items of survival kit. After crash landing, leave the aircraft as quickly as possible through the correct exits owing to the fire risk. If there is no fire, return and collect all useful kit and equipment. In either case, passengers should be helped to leave the aircraft safely.

Action by the Pilot

24. The safety harness should always be tight and locked but, if worn, the parachute harness should be released so that it does not impede escape. At the moment of touch-down, an arm held across the forehead with the hand gripping a convenient hold will reduce the risk of injury from gunsights and similar projections.

General

25. Stowed emergency equipment should not be removed from stowage until the aircraft has come to rest.

26. All crew members should be familiar with each other's duties, in case a member is injured.

27. It is of the utmost importance not to relax or move until the aircraft has come to rest.

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