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# ADMIRALTY FLEET ORDER

## NAVAL AIRCRAFT—FORCED ALIGHTING ON WATER— REPORT

ADMIRALTY, S.W.1,

25th June, 1942.

The following Order having been approved by My Lords Commissioners of the Admiralty is hereby promulgated for information and guidance and necessary action.

By Command of their Lordships,

*H. V. Markham*

**Distribution Limited**

To *Commanders-in-Chief, Flag Officers, Senior Naval Officers, Captains and Commanding Officers of H.M. Ships and Vessels fitted for Aircraft, and H.M. Naval Air Stations and Sections.*

(See A.F.O. 3338/40)

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## 3071.—Naval Aircraft—Forced Alighting on Water—REPORT

(A. 0664/42.—25.6.1942.)

In order to ensure that naval aircraft crews are familiar with the procedure to be carried out in cases of forced alighting on water, Squadron Commanders are to take steps to instruct their squadrons in the location of the emergency equipment provided and method of use. Frequent drills are to be carried out, and demonstrations given of action to be taken:—

- (a) Preparatory to making a forced alighting.
- (b) After the aircraft has struck the sea.

2. Pilots are to be responsible for seeing that all emergency equipment which should be carried in their particular type of aircraft is actually fitted, and that they and all members of their crew are fully conversant with the location of such equipment and the method of operating it.

3. The following notes, based on recent experience, are promulgated for information and guidance:—

- (1) Torpedo, bomb or depth charge load should be jettisoned.
- (2) Expend all ammunition both in front and rear guns.
- (3) The undercarriage, if retractable, should be retracted.
- (4) The alighting should be made into wind.
- (5) *Power available.*—If power is available it is best to fly the aircraft on to the water at the lowest practicable airspeed. Allow the aircraft to sink slowly till the tail strikes the water and then at once close the throttle. If the nose is seen to be about to meet a wave, the control column should be pulled hard back to get the tail down, and the throttle at once closed.

It is generally advisable to use the flaps in order to reduce the possible speed of approach; but where an intermediate position is available they should be set about half-way down since it is lift and not drag which is most required. (This supersedes the instruction given in A.F.O. 3567/41, paragraph 3 (3) that flaps should always be fully down). With the recommended flap setting, the attitude of the aircraft will be suitably tail-down at the lowest safe speed of approach. The reduction of possible flying speed which the use of the flaps permit must be used, or the use of flaps will be disadvantageous; for at any given I.A.S. the lowering of the flaps leads to a less tail-down flight and the aircraft is likely to strike the water too little tail-down if the flaps are down at an unnecessary high airspeed.

Ditching with engines is so much easier and safer than without that the pilot should never leave ditching until he risks an engine cutting.

- (6) *No power available.*—In this case the pilot has to carry out a landing manoeuvre to cause the aircraft to strike the water tail-down at the lowest possible forward and downward speed; and he has to judge his height.

He may meet the water before he expects to do so; the attitude of final approach should therefore be as tail-down as possible and the speed and rate of descent as low as possible. He must have the margin of speed in hand which is necessary for flattening out, but he should ideally have no more than the minimum margin above stalling speed. In the normal landing a light touch-down is achieved by sinking gently from a "float." In ditching there should be no "float," for the sea may strike the aircraft at any moment while the speed is still higher than the minimum possible and fracture or diving-in may be much more serious than "ballooning off" on land.

The aircraft should not be deliberately dropped on to the water from several feet, but the pilot should aim to flatten out a little on the high side. Little downward velocity is acquired in a small drop.

- (7) *Ditching in a rough sea.*—If there is a heavy swell and a light wind the aircraft should be ditched along the top of the swell, regardless of the direction of the wind.

If there is much wind, the pilot should ditch up-wind regardless of the direction of swell.

A low wing, single engined aeroplane will ditch safely with a little drift; but with other aircraft, especially high wing, drift is a serious source of danger and the pilot must try to eliminate the drift by sid-slipping up-wind.

Waves that are not large compared with the aircraft can be ignored. If anything, they will tend to cushion the shock and it is easier to judge height when the sea is not too calm. It is, however, often difficult to detect the presence of the larger waves or swell until almost at sea level.

- (8) *Some special cases.*—Certain fighters are peculiarly liable to dive—*e.g.* Sea Hurricane and, to a lesser degree, Seafire.
  - (a) Sea Hurricane can only be ditched without diving if the touch-down speed relative to the water is not greater than about 43 knots (flaps half down).
  - (b) Seafire may be ditched without diving up to about 65 knots relative speed (flaps fully down).
- (9) Safety harness or belts should be kept on, with straps or other adjustment tight, in order to avoid injury to personnel when the aircraft hits the water. (It must be remembered that there is frequently a distinct interval of time between the first impact, when the tail touches the water, and the final shock due to rapid deceleration. It is, therefore, most important that safety belts should not be released until this deceleration has taken place.)
- (10) If time, remove the helmet to avoid last-minute entanglement with oxygen apparatus, Gosport tubes and telephone leads, but retain helmet for use in dinghy as a guard against cold.
- (11) Parachute harness should be released before alighting except when the "K" type single-seater dinghy is being worn, when it should on no account be released before leaving the aircraft, otherwise the dinghy may either be lost or damaged. If there is time to collect the parachute and take it into the dinghy, it can be used as a wrap, a means of attracting attention or as a sea anchor.
- (12) See that lanyard of "K"-type dinghy is made fast to life-saving jacket.
- (13) Life-saving jackets should be partially inflated only, so as not to impede getting out of the aircraft. In the case of life jackets inflated by air bottle, the control lever should not be pulled until the crew are out of the aircraft.
- (14) Loosen the collar; it is liable to choke the wearer and a wet tie is difficult to remove.
- (15) Dinghies should not be inflated before alighting.
- (16) The cockpit hood and exit escape hatches on top of fuselage should be opened to avoid being jammed by the impact.
- (17) At night, it is advisable that all bright internal lights should be extinguished as long as possible before alighting, in order to enable the crew to accustom themselves to the surrounding darkness immediately they enter the sea. Parachute flares and landing lights are only effective under certain conditions and no hard and fast rules can be laid down.
- (18) As long as the aircraft remains afloat the crew should try to keep near it as their chance of being spotted is thereby very much greater.
- (19) Crews must keep a sharp look-out, especially during the first few seconds after inflation, of any signs of the dinghy becoming entangled. A floating knife attached to the dinghy is being incorporated as a modification. The stowage of unofficial equipment with the dinghy should not be allowed.
- (20) There is sometimes a tendency for certain portions of the dinghy to tend to stick together. Efficient maintenance and liberal use of French chalk on repacking will prevent this.
- (21) Careful weighing of CO<sub>2</sub> cylinders after recharging is essential to avoid risk of bursting.



- (22) If the dinghy is upside down, one of the crew should jump into the sea to right it. Jumping on to the dinghy while inflated should, if possible, be avoided, as this causes expulsion of the air underneath giving rise to a considerable suction, which increases the difficulty of righting. Handling patches on the bottom of the dinghy are being fitted to all new dinghies and to existing dinghies as a modification.
- (23) Great care is necessary in the treatment of dinghies carried in valises, and they should on no account be used as a step or seat owing to risk of damage to the dinghy fabric.
- (24) Marine distress signals must be treated with the greatest care, and kept as dry as conditions permit. They must not be used as paddles, as this will strain the shaft, causing ingress of water, which will render it useless for signalling. They are being replaced by a pistol and 30 cartridges as soon as supplies are available.
- (25) Fluorescine sea markers are of proved efficiency and four are to be carried in each dinghy, in addition to the fluorescine pad carried by the crew on their life-saving waistcoats in the manner laid down in A.F.O. 3578/40 (cancelled by A.F.O. 1798/42). Each block will last from four to six hours.
- (26) Torches, electric, type "F" (Reference No. 5A/2373), which were introduced by C.A.F.Os. 160/41 and 641/41, are to be drawn by all flying personnel and carried always. The battery container should be secured in the pocket. The light should be used immediately if one of the crew finds himself separated from the rest.
- (27) A good whistle, readily accessible, is a valuable means of attracting attention and these are now being issued with the new yellow life-saving waistcoats. A 2-in. length of rubber tube attached to the whistle will enable it to be attached to the topping-up bellows and so save a lot of breath.
- (28) Canned water on a scale of two cans per man is being fitted in dinghy emergency packs. Strict rationing must be instituted from the beginning.
- (29) Continual exercise and keeping awake are most important and this can best be accomplished by the crew giving one another vigorous massage.
- (30) Care must be taken that the dinghy is not trapped under the aerals of the sinking aircraft.
- (31) However wet and soggy the clothes, they provide a good measure of protection from exposure, and it is most important therefore that they should not be taken off.
- (32) The tube of Gentian jelly (A.F.O. 3198/41) and tubonic ampoule (A.F.O. 944/42) carried by flying personnel is being replaced by a pocket first-aid outfit. A small first-aid outfit will also in future be fitted in the emergency pack in lieu of the large first-aid outfit hitherto fitted in the aircraft.
- (33) Emergency equipment which should be carried in aircraft is shown in A.F.O. 1795/42. Aircraft Appendices A are being amended.

#### 4. Reports on ditching required by Admiralty.

In order to assist research into the problem of design of ship planes with reasonable ditching properties and to assist development of suitable emergency equipment a report is to be forwarded to the Admiralty on all occasions that an aircraft ditches. The report is to conform to the following questionnaire:—

- (1) (a) Type and number of aircraft, squadron and ship or station.
- (b) Time, date and place of ditching.
- (c) State of sea.
- (d) Strength of wind, and direction relative to swell.
- (e) Condition of light and visibility.
- (f) Condition and height of cloud.
- (g) Any other weather conditions.

- (2) (a) Reason for ditching.
- (b) Quantity of fuel in tanks.
- (c) Bombs and/or other load.
- (d) Had aircraft been engaged by enemy and what known damage had been done?
- (e) Was engine power available?
- (f) What equipment was jettisoned?
- (g) What radio messages were transmitted and received, *i.e.*, distress, S.O.S., request for bearings, etc.?
- (h) Was position transmitted?
- (i) Was a fix obtained?
- (3) (a) What flap setting was used?
- (b) Describe method of approach.
- (c) What was speed at impact, and attitude of aircraft?
- (d) How was aircraft ditched relative to direction of wind and swell?
- (e) Describe exactly what happened from moment aircraft first touched water until it finally came to rest.
- (4) (a) Were any of the crew injured as a result of enemy action before ditching?
- (b) Were all the crew strapped in?
- (c) Describe what each man did immediately after ditching, and whether any were injured by the impact.
- (d) How long did aircraft float?
- (5) (a) State type and mark of dinghy used.
- (b) Was dinghy automatically or manually released?
- (c) Was dinghy release and inflation satisfactory?
- (d) Did anyone fail to reach dinghy and if so, why?
- (e) Was emergency pack released satisfactorily?
- (f) How and when were life-saving jackets inflated and did they function satisfactorily?
- (g) How long were crew in dinghy?
- (h) Did crew suffer from immersion, heat or cold, and what steps were taken to combat these?
- (i) What equipment was available, and how and when was it used?
- (j) What rationing was instituted?
- (k) How were you finally rescued?
- (6) (a) What dinghy drill training had previously been carried out by the crew?
- (7) General remarks and suggestions regarding ditching and emergency equipment.

(A.F.Os. 3198/41, 944/42, 1795/42, 1798/42, C.A.F.Os. 160/41 and 641/41.)

(A.F.Os. 1733/40 1668/41 and 3567/41 are cancelled.)



