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ROYAL CANADIAN AIR FORCE



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OPERATING INSTRUCTIONS OPERATION AND HANDLING OF LIFE-RAFT EQUIPMENT

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OPERATION AND HANDLING OF LIFE-RAFT EQUIPMENT

INTRODUCTION

1 It has been said that the best way to be realistically alive to the value of emergency life-raft equipment is to be placed in circumstances which awaken a thorough consciousness of its importance, and where practical experience gives direct knowledge justifying the detailed understanding which has been previously acquired.

2 Under such conditions, life-raft equipment assumes a new and wider perspective and significance - a perspective not perhaps so easy to appreciate when the robust construction of the aircraft is compared with the light and flexible, though highly efficient construction of the life-raft.

3 Just as ships carry life-boats, so also is it necessary for aircraft to be provided with emergency life-raft equipment.

4 If you do not know exactly how to use the equipment, or the precautions to be observed, do not rely on the other fellow knowing - find out for yourself and, if in doubt, enquire. You may have the opportunity of talking to personnel who have used the equipment in an emergency and this will assist you to visualize the conditions which you might have to meet yourself and also help to instill that complete confidence in life-raft equipment when it is operated in accordance with the specified drill.

5 Successful operation of life-raft equipment demands that infinite care and attention to detail be taken, not only on the part of the

aircrew, but also on the part of the ground personnel responsible for the inspection, maintenance and packing, upon whose thoroughness many lives may depend, because, as is well known, the functional use of emergency life-raft equipment is to save life by keeping the crew of the ditched aircraft afloat and comfortable until rescued.

6 Emergency life-rafts can be broadly divided into two classes:-

(a) One provides each member of the crew with an individual life-raft, stowed in a pack attached to the parachute harness, thus forming part of the wearer's personal equipment. In this case, each man with his equipment and knowledge is self-dependent and largely responsible for his own safety.

(b) The second class provides one or perhaps two large life-rafts to support the entire crew. The equipment is stowed in the aircraft in a valise or a blow-out stowage compartment from which it is either manually or automatically ejected. In multi-seat life-rafts, it is important that each man is fully trained as circumstances may arise where he is not only responsible for his own safety, but also for that of his colleagues, who through injury or for other reasons may be unable to carry out their part of the drill.

7 When the life-raft starts to inflate and ejects itself, either by forcing open the snap fasteners on the valise or by bursting open the cover of the blow-out stowage compartment, it becomes buoyant within one minute. The inflation is obtained by releasing gas from a

cylinder either manually or by an automatically controlled operating head attached to the cylinder.

8 A life-raft thus inflated will remain afloat indefinitely, but provision is made for retaining its buoyancy by the use of bellows and leak stoppers, whilst the crew is provided with means of sustenance, recognition and navigation enclosed in separate waterproof containers.

9 From the operational aspect, the successful launching of the life-raft (except in the case of the single-seater life-raft) and subsequent rescue of the aircrew, depend, as mentioned before, on team work, which is most important, as each member of the crew has some duty assigned to him in accordance with the respective drill, and this should be carefully and frequently rehearsed.

10 It will be clear, therefore, to all personnel connected with the equipment that in view of its great value for saving life, no effort should be spared to attain and maintain the very highest degree of efficiency in all aspects of the work, however tame or tedious it may sometimes appear. Ultimate success can only be obtained by a collection of small but effective contributions which each is asked to make, and all instructions or regulations referred to or contained in Engineering Orders should be strictly observed.

11 Events have dictated that emergency life-rafts must assume a position of greater importance than might have been expected and continuous investigation and development is being carried out to ensure that the safest, most reliable and most comfortable equipment is provided. It is to be expected, therefore, that new equipment will be issued from time to time and this will necessitate regular reference to Engineering Orders in order to keep abreast of such developments.

OPERATION OF A LIFE-RAFT INSTALLATION

12 A brief outline of the operation of a collective installation is given here in order that a clearer picture may be seen of the functions of the various items.

13 Life-rafts stowed in most blow-out stowages are provided with an automatic control which is in the form of an immersion switch which actuates as soon as it is immersed in water. The percolation of water into the switch completes an electrical circuit which fires a cartridge housed in the operating head of the CO₂ cylinder attached to the life-raft. A plunger inside the operating head pierces the sealing disc of the cylinder and enables the CO₂ gas to pass through the life-raft valve into the life-raft. As the life-raft expands, the stowage cover is forced off and the life-raft is free to emerge. After complete inflation has been effected, the life-raft is clear of the aircraft but attached to it by a painter. After the crew have boarded the life-raft, the painter is severed by the use of the knife provided on the life-raft. The automatic control is supplemented by the provision of a manual control which operates the CO₂ operating head by a cable control. The end of the cable is inside the aircraft fuselage and its use does not impede the working of the automatic control.

14 In the case of the valise-stowed life-raft, there is no automatic control. As soon as the aircraft has come to rest, the valise is thrown out by one member of the crew. There is an operating cord stowed on the valise, one end being attached to aircraft and the other connected to the operating head on life-raft. When the limit of this cord is reached, tension in the cord actuates the operating head and the life-raft commences to inflate. As it does, the snap fasteners on the valise are forced open under the pressure and life-raft is freed. It still remains attached to the aircraft by the operating cord which is severed as soon as the crew is aboard.

NOTE

The operating cord will be a minimum length of 20 ft. and a maximum length of 30 ft. depending on the size of aircraft and location of stowage. If present operating cord is not long enough, it is to

be replaced by a new operating cord 32B/451. Difficulty may be experienced in stowing the additional cord in the present painter stowage. If this occurs, it is to be folded in a hank and secured with one turn of #40 thread.

15 Obviously, such installations cannot be

used until after the aircraft has ditched. With an individual installation, which employs the single-seat life-raft, it is possible to make a parachute descent into the water and then inflate the life-raft. The sequence of operations for the use of this life-raft is given in EO 55-30LA-2. The initial stages vary slightly according to the type of pack used.

16 To ensure that flying personnel can obtain the maximum benefit from the life-raft equipment, ditching instructions for each type of aircraft is available in the Pilot's Operating Instructions (-1 series) and if this is studied, such personnel will have all the information required.

CARE IN HANDLING

17 The apparent fragility of the equipment in relation to the task imposed upon it, necessitates that extra care be taken by all personnel when handling it. As life-saving gear, it should be regarded with a certain amount of respect. It is important too, that the particular type of installation is not altered to comply with personal requirements. Each scheme has been approved, and it is dangerous to modify it, particularly to try to add further equipment to the installation.

PRECAUTIONS TO BE OBSERVED BY GROUND PERSONNEL

18 There are certain precautions which apply particularly to the personnel who are responsible for the packing and repair of the equipment and these are given below.

19 The rubberized fabric, of which the life-raft is chiefly composed, is subject to deterioration from the effects of strong sunlight, heat, oil and grease. It is therefore imperative that all life-rafts are kept clear of such sources of possible damage, particularly the latter two.

No equipment should be placed on surfaces containing projections likely to perforate the fabric.

20 Before fitting a CO₂ cylinder to a life-raft, ensure that it is of the correct charge and that it is fully charged. With all cylinders except the Mk. IX, if the sealing disc is unpierced, the cylinder is charged. The charge should be checked by weighing (EO 55-25A-2). With the Mk. IX cylinder there is no sealing disc and the cylinder should be weighed.

21 When a life-raft is packed for stowage, in either a blow-out compartment or a valise or other pack, it is most important to ensure that all air has been expelled. If not, the life-raft will partly inflate at higher altitudes due to expansion of the trapped air and, in the case of a blow-out stowage, this expansion may be sufficient to open the cover.

22 If a life-raft has been folded, but is not placed in its stowage immediately, air may re-enter due to porosity of the fabric. Life-rafts thus stored must therefore be repacked before finally being placed in their stowage.

LIFE-RAFT INSTALLATION IN AIRCRAFT

23 As mentioned in the introduction, life-raft installations can be broadly divided into the two types - individual and collective. The first is concerned with the life-raft equipment, which forms part of the personal equipment of any member of an aircrew, whereby he is provided with a single-seat life-raft with weather protection, food rations and other equipment, all of which is condensed into a pack to form a compact and self-contained unit. This method of installation is provided in different types of packs which permit their application to practically all types of aircraft.

23A When valise life-rafts are installed in

aircraft the valise must be stowed in the horizontal position.

24 Where an aircrew numbers two or more, the individual installation is supplemented by the addition of one or more multi-seat life-rafts together with additional food rations and other ancillary equipment.

ALLOCATION OF EQUIPMENT

25 In the case of collective installations, the multi-seat life-raft with certain items of equipment attached to it, is stowed in a special compartment in the wing or fuselage; this is termed a blow-out stowage. The ancillary

equipment is housed in survival kits which are either stowed adjacent to the life-raft in the blow-out stowage or close to one of the emergency exits. Where the blow-out stowage is not employed, the life-raft is packed into a valise which is stowed near one of the emergency exits. The survival kits are stowed alongside.

26 It is not possible to lay down a standard list of contents for collective installations. Each aircraft has its own combination, and reference should be made to the relevant aircraft handbook for details of the type of stowage and CAP 603, Scale D53, for the allocation of equipment.

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