

NATIONAL INSTITUTE OF OCEANOGRAPHY

WORMLEY, GODALMING, SURREY

**Regulations for Fin-swimmers
and Shallow Water Divers**

N.I.O. INTERNAL REPORT No. A.43

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Introduction

(1) Launching and recovery of heavy equipment at sea sometimes involves operations in which swimmers or divers can be of assistance. Since every type of equipment will entail a different type of operation, it is difficult to lay down hard and fast rules about training and safety regulations. Nevertheless, the regulations outlined here are to be taken as a firm guide to the standard of safety required in the conduct of swimming and diving operations. As experience is gained at sea these regulations will be up-dated from time to time as necessary.

(2) Since it is not necessary or practicable to train and maintain a fully qualified deep diving team certain personnel who have suitable aptitude and who are prepared to undergo voluntary training should be trained in the basic skills required. They are not however expected to maintain their standard of diving training continuously, as this would involve frequent training dives. In lieu of continuous training it is proposed that, before each cruise in which swimmers or divers are to be employed, the team should devote the necessary time to defining and rehearsing drills under supervision, and devote further time to practising these drills at sea at the earliest possible opportunity during the cruise.

(3) Swimming Training

a) All operations are likely to take place many miles from shore, and, in the event of becoming separated from the ship, the swimmer must be capable of swimming or remaining afloat for several hours.

b) Initial training and pre-cruise training will be undertaken in a suitable pool under the supervision of an instructor who must have a Navy Diving Supervisor qualification, British Sub-Aqua Club 1st Class qualification, or equivalent qualifications.

c) Proper records of training progress should be kept. A specimen record sheet for pool training is attached as Appendix I. On completion of the fin swimming tests the trainee is qualified to participate in sea-going operations on the surface without the use of an aqualung. However, in the event of a successful trainee not having previous sea swimming experience, the Dive Leader is responsible for ensuring that the trainee has at least 5 hours of fin swimming at sea before taking part in practical operations.

d) Notwithstanding completion of the tests in the pool formal qualification of the trainee as a Fin Swimmer is at the discretion of the Instructor.

e) Standards of theoretical knowledge required of diving physiology, equipment, safety, and organisation, shall be established by the Instructor.

f) Before taking part in sea-going operations Fin Swimmers must have a medical examination, and this examination should be repeated annually.

(4) Swimming Equipment

a) All swimmers should wear fins, mask and snorkel, and wet-suit for protection from cold. Head-hoods, feet, and gloves, should be worn if the water is particularly cold. Weights should be worn as necessary.

b) Swimmers should wear life-jackets, preferably air-inflatable. As well as providing buoyancy in emergency an air-inflatable jacket can be used to aid the swimmer at any time when carrying a heavy weight in water.

c) Swimmers should carry a whistle, pyrotechnic flare, and fluorescein dye package, and electric light. If risk of separation is serious the swimmer should wear a radio location beacon, several types of which are commercially available.

(5) Swimming Operations

a) In most diving and swimming accidents the victim reaches the surface of the water but is not picked up. That is to say, the principal danger in all such operations is becoming separated from the ship and not having the endurance or suitable equipment to survive until recovery. Accidents are prevented by preliminary training, having the right equipment, and conducting operations with maximum safety. Most accidents occur because of the cumulative or coincidental failure of a number of small elements. It follows that serious accidents can be prevented if small accidents can always be corrected quickly. Thus, learning to anticipate possible minor accidents and knowing the correct drill to counteract them is essential. Swift reaction to small accidents is not possible if the swimmers are:-

Unduly cold
Tired
Apprehensive or panicky
Drunk
Ill

It is up to the individual swimmer to be aware of the state of his own health, and in particular not to swim or dive when afflicted by colds or respiratory diseases, or anything which is likely to make him sick. He should also refrain from swimming or diving if tired or run down, or after a heavy meal or alcohol. If swimming operations are planned for the day, then a heavy meal should not be eaten before or during operations. It is better to rely on fairly frequent snacks and bowls of soup throughout the day.

Apprehension and tendency to panic are brought on by poor training, uncertainty, and lack of comfort or anticipation of pain. All these can be avoided, by proper training, clear instructions and rehearsals of routine, and by caring for the swimmer's comforts. This last point is sometimes neglected, but it is essential for efficient and safe work. If operations are extensive there should be adequate warm food and snacks, and on the completion of work the swimmers, if cold, should have attendants to help remove suits, provide warm drinks and warm water or showers.

b) One person should have overall responsibility for the safety and conduct of swimming operations. This person may or may not be a member of the swimming team; if he is not, then a member of the team should be delegated as Dive Leader. This appointment should be approved by the Instructor.

c) Instructions to the swimmers will be given by the overall project leader via the Dive Leader. The Dive Leader may request modification of the instructions if he considers that it would be dangerous to carry them out.

d) Operations will normally be carried out from the ship with the assistance of a powered dinghy. There should be radio communication between the ship and the dinghy, with one man on board the ship detailed to maintain contact and observe the swimmers in case one becomes separated. Since the crew of the dinghy may be fully occupied with the work in hand the observer on the ship has responsibility to notify the dinghy that the swimmer appears to be

drifting away. A procedure should be agreed for notifying the dinghy and despatching the dinghy to recover the man if necessary. If the manoeuvre is likely to separate the dinghy from the ship, then the bridge should be informed. Whenever possible a light line should be streamed astern of the area where swimmers or divers are working so that, in the event of surfacing far astern of the dinghy, the swimmer can swim to the line and hold or pull himself back to the work area. It is appreciated that in some cases there may not be a suitable point of attachment for a streamed line, or it might cause a risk of accident or confusion by becoming entangled in other equipment.

e) The helmsman of the dinghy need not be a member of the swimming team.

f) If only one swimmer is needed for a task, then there should be a second member of the swimming team standing by to assist him if necessary. If more than one member of the team is in the water then no further standby swimmer is required.

g) It is normal diving practice to avoid having swimmers in the water while the ship's screws are turning. Since this rule must be broken for most operations, every precaution should be taken to ensure that swimmers are not in the water ahead of the ship's screw or near the stern. In every case swimmers should remain in the dinghy until as far from the ship as possible before entering the water.

i) If a swimmer drifts away from the dinghy and is unable to swim back or reach the streamed line, or is unable to attract the attention of the crew he should first use the whistle. If this fails he should use a pyrotechnic flare. If he is unable to attract attention and is clearly drifting too far from the ship for his signals to be seen, he should conserve energy and not use the dye marker or reserve pyrotechnic unless the ship can be seen to have changed course and to be carrying out a search. The radio distress beacon should be used if fitted, and a light should be switched on at night.

j) If a swimmer is noted to be drifting he should be picked up immediately by the dinghy. If a swimmer drifts unnoticed until he sends up distress signals or whistles, a suitable buoy of low windage should immediately be dropped to mark the most likely area for a search in the event of the swimmer not being quickly recovered, while the dinghy should recover other swimmers in the water and then proceed to the aid of the distressed swimmer.

k) If a swimmer is reported missing a marker buoy should be dropped immediately to aid navigation during the search and the ship should steam systematically in a search.

l) If the swimmer or diver has drifted far from the ship and sees that a buoy has been dropped he should make every effort to remain close to the buoy, or swim to it.

m) Since in the case of a rescue the dinghy may be considerably separated from the ship, there should be a reserve fuel tank on board, and an emergency pack of pyrotechnic flares, food, and water.

(6) Shallow Diving Training

- a) For many tasks in equipment handling and maintenance it is adequate to have divers who are trained to work only to a depth of thirty feet. This is comparable with the Navy classification of Shallow Water Diver.
- b) It is practicable to employ Shallow Water Divers on the basis of periodic retraining as envisaged in para. (2).
- c) A person volunteering for Shallow Water Diver training should pass the qualification tests laid down for Fin Swimmer in Appendix I. He should further obtain an annual medical certificate from his doctor stating that he is fit to dive.
- d) The trainee shall complete the tests listed for Aqualung Training in Appendix I.
- e) Notwithstanding completion of the tests in the pool formal qualification of the trainee as a Shallow Water Diver is at the discretion of the Instructor.
- f) Standards of theoretical knowledge required of diving physiology, equipment, safety, and organisation, shall be established by the Instructor.
- g) On completion of the Aqualung Training tests in the pool the trainee is qualified to participate in sea going operations involving diving to a depth of 30 ft. If the trainee does not have previous experience of diving at sea the Dive Leader is responsible for ensuring that the trainee has 5 dives of minimum duration 15 minutes each to a depth of 30 ft. before using an aqualung in practical operations. All divers should make at least one such dive.

(7) Diving Equipment

- a) Divers shall use only compressed air demand valve breathing equipment.
- b) All cylinders, hoses, compressors, used to handle compressed air shall be suitably rated and inspected.
- c) Divers shall wear safety equipment as itemised for swimmers in paragraphs 4 (a), (b) and (c) above.
- d) Proper checks should be maintained on the purity of air supplied from a compressor or storage cylinders.

(8) Shallow Diving Operations

- a) Each diver shall maintain a log book recording time of entry and exit from the water, maximum depth, equipment used, location, pressure before and after the dive, and a brief description of the task for every dive. No dive shall be deeper than 30 ft.
- b) Section 5 (a) above on prevention of accidents applies equally to divers.
- c) One person shall have overall responsibility for the safety and conduct of diving operations. This person may or may not be a member of the diving team; if he is not, then a member of the team should be delegated as Dive Leader. This appointment should be approved by the Instructor.

- d) Instructions to the divers will be given by the overall project leader via the diving team leader. Diver Leader may request modification of the instructions if he considers that it would be dangerous to carry them out.
- e) As paragraph 5 (d) above.
- f) As paragraph 5 (e) above.
- g) If only one diver is required underwater there should be a snorkel swimmer on the surface watching the diver or his bubbles if visibility is limited, and there should be a standby diver fully kitted up on the dinghy. If more than one diver is required underwater, there shall still be a snorkel cover and standby diver kitted up.
- h) If a diver is in the water alone in low visibility he should normally be on a line to the surface attendant or to the snorkel cover unless the use of a line would produce serious danger of entanglement with equipment or other lines. If two divers are submerged together they should remain within visual range of each other, and one should be in charge of the dive. If visibility is too low to maintain visual contact the divers should be connected by a buddy line.
- i) If a diver surfaces and finds that he is completely separated from the dinghy and surface cover he should proceed as in paragraph 5 (i) above. As soon as he realises that he is separated from the boat he should drop his weight belt. But he should not drop the aqualung until it is apparent that the whistle and pyrotechnic flare have failed to attract attention.
- j) If a diver surfaces but is drifting from the boat, the procedure for the dinghy and ship is as in 5 (j), (k) above.
- k) If a diver fails to surface and is not on a line or a buddy line it is possible either that he is entangled with equipment, has drifted away and surfaced elsewhere, or has sunk completely. Accordingly a buoy should be dropped to aid in an area search, while the standby divers should examine all submerged lines and equipment to ensure that the diver is not trapped. If bubbles are observed ascending from deeper water the divers may descend as a pair down the bubbles to a maximum depth of 100 feet in an attempt to recover the distressed diver. If the diver is not located close to the equipment a search should be instituted as in 5 (k) above.
- l) A diver who appears to be drowned should be given artificial respiration by the mouth-to-mouth method as soon as possible. In calm conditions mouth-to-mouth respiration can be given by one swimmer to another on the surface.

APPENDIX I

SWIMMING AND DIVING TEST RATING SHEET

NAME: _____

AGE: _____

SWIMMING

- 100 yds. freestyle
- 50 yds. back stroke
- 50 yds. with 10 lbs.
- Float for 5 minutes
- Tread water for 1 min.
- Recover 6 objects from 10 ft.

FIN SWIMMING

- 600 yds.
- 1200 yds.
- 1 mile
- Back stroke
- Side
- Front
- Dolphin
- Crawl with fins, no mask
- Crawl with fins and mask and snorkel
- Duck dive
- 25 yds. underwater
- 50 yds. with one leg
- Fit equipment in water
- Life saving as per BSAC
- Forward and backward rolls

AQUALUNG TRAINING

- Test air
- Fit valve and test
- Fit equipment and entry
- Mask clearing
- Tube clearing
- Clear tubes without mask
- Swim submerged without mask
- Swim blacked out
- Swim 50 yds. sharing
- Ditch all equipment
- Don equipment submerged
- Forward and backward rolls
- Life saving, as per BSAC
- Artificial respiration

Date	Date	Date

General comments

