

Fitness Requirements for RNLI Beach Lifeguards operating Rescue Watercraft and Inshore Rescue Boats

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Introduction

In 2003 the University of Portsmouth recommended fitness tests for RNLI beach lifeguards. These tests did not cover the use of Inshore Rescue Boats (IRB) or Rescue watercraft (RWC).

The present project addressed 3 aims:

1. Determine the most physically demanding tasks involved in operating a RWC and IRB
2. Measure the external loads associated with the use of these craft
3. Develop tests to determine if a BLG has the minimum strength/fitness required to safely operate a RWC and IRB.

Methods

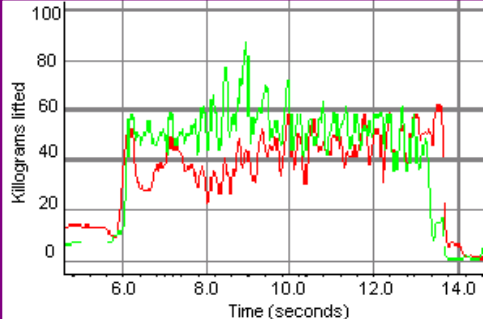
A questionnaire study of RNLI supervisors and managers (N=10) identified the most demanding physical tasks as lifting, loading, pulling and launching the IRB and RWC.

Load cell force dynamometers, as well as mobile data loggers were employed between the BLG and point of contact for the lifting and shifting tasks. Figure 1a shows subjects performing the task of dragging the boat out of the sea with the prop up.



Figure 1 a and b:

Photo and graph display load measured for each BLG while pulling the IRB, 10 metres parallel to the sea, along the beach on wet sand.



The contribution of each subject is represented by each line on Figure 1b. Where the task required two people the contribution of each person was measured.

The physical demands of the following physical tasks were measured at Perranporth and Bouremouth beach

1. Pull IRB down beach on trailer
2. Lift front of trailer with IRB on it to slide IRB off the back
3. Raise engine by the prop
4. Lift bow of IRB off the trailer
5. Lift IRB with one man on each side using the side handle, drag down the beach
6. RWC launching – pull from the bow and drag down the beach 10 metres
7. Dry Sand – Pull IRB on trailer, 10 metres parallel to the sea on beach
8. Wet Sand – Pull IRB on trailer, 10 metres parallel to the sea on beach
9. Pivot and drag IRB in wet sand with prop up on tilt lock engine still dragging in sand
10. Pivot and drag IRB in wet sand with prop up all the way- secured by paddle
11. Pull IRB out of the Sea
12. Pivot RWC 180 Degrees
13. Lift IRB at bow to slip trailer in underneath
14. Force on strap when operating winch and recovering RWC onto trailer
15. Turn Crank to pull RWC onto trailer. Force required when rotating crank measured

Repeated trials of these tasks were performed by supervisors to ensure the subjects employed the method of best practice.

Results and Conclusions

The final fitness test reproduces the following requirements of BLG

1. Lifting the RWC at the bow to load on to the trailer (2 person job)

An RWC crew member must be capable of lifting 55kg from the floor to a height of 30 cm

To simulate this lift as a fitness test the lift should be performed with an underhand grip using 2 oil cans full of water. Each can must weight 25kg. The BLG must lift this mass and hold the cans 30cm above the ground for 3 seconds.

2. Dragging the IRB for launch or recovery, over the sand (2 person job)

3. Pivoting the RWC (2 person job)

To drag the IRB (V strips, and prop all the way up) 10 m, with each crew member pulling with one hand on the side handle, requires a initiation force of 63-82kg depending on the side, and a mean force over the pull of 42-53kg.

Therefore a IRB crewmember must be capable of initiating a pull force of 80kg, in this posture, and generating a force of 50kg for 5 metres, with each arm.

To simulate this one person must pull the IRB without the engine or the fuel bladder, gripping from the upper handle wrapped around the lower handle of the bow (Figure 2), (mean of 52kg).



As potential operators will already be BLG, the tests employ BLG equipment wherever possible and are designed to be carried out on the beach.

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