

## Assist in Search and Rescue Operations- Answers

2008 Answer Sheet

Total marks available - 00

### **Element 1- Assist in planning search and rescue operations**

Describe to your assessor or write a short answer, using diagrams if required, to the following questions.

#### **Question No.1**

List twelve distress signals.

1. Yes (C) & No (N) flags flown together
2. Any visible fire or smoke
3. Flares, (red, smoke or parachute)
4. Mayday over the radio
5. EPIRB
6. Square flag & a ball either flown separately or on a sheet
7. A Gunshot
8. Raising & lowering arms
9. V sheet
10. SOS (... --- ...) by light or sound signal
11. Distress call on a DSC radio
12. Dye marker

#### **Question No.2**

List five International code single letter signals.

1. O – man overboard
2. V – I require assistance
3. A – I have a diver down
4. B – I am taking on or discharging dangerous goods
5. D – Keep clear of me I am manoeuvring with difficulty

#### **Question No.3**

How would an aircraft direct a surface craft without radio aids?

Fly low overhead rescue vessel then set off in direction required.

#### **Question No.4**

What are the components of a search and rescue plan?

1. Information
2. Briefing
3. briefing of communications required and reporting schedule
4. Assessment of hazards at scene & response required
5. Sitreps on return leg

6. ETR
7. De-briefing outcome/recommendations
8. SAR Administration review details

**Question No.5**

What type of information is task information?

It is information gathered to appraise the needs of the operation and consists of

1. Who
2. What
3. When
4. Where
5. Why
6. Conditions
7. Injuries

**Question No.6**

What type of information is operational information?

It is information required for the logistics of the operation and consists of

1. Distance to go
2. Departure point
3. Sea conditions
4. Weather forecast
5. Tides
6. Daylight (time of last light)
7. Routing hazards

**Question No.7**

How is the probable position is found from the LKP (allow for wind and current)?

1. Establish LKP
2. Determine maximum distance from this position that survivors could have drifted, use of a floating object to work out drift rate and direction or by known sea currents
3. using known wind conditions and tables to calculate leeway
4. An approximate track that is known via a sail plan lodged.
5. An approximate area that it is known vessel had been operating in
6. Eye witness reports or flares seen

**Question No.8**

What is the relationship of coverage factor to sweep width and track spacing?

Sweep width and/or track spacing is determined by the distance at which survivors are likely to be seen. The smaller the sweep width or track spacing the less area that can be covered in a set on task time.

**Question No.9**

How would you navigate an expanding square search?

Set a predetermined track spacing (PTS), depending on distance likely to see survivors

Proceed in 1 direction for 1 x PTS

Turn 90° and proceed for 1 x PTS

Turn 90° and proceed for 2 x PTS

Turn 90° and proceed for 2 x PTS

Continue thus.

After 2 x 90° turns increase PTS by a factor of 1

All turns are made in same direction

**Question No.10**

When can a sector search be most effective?

If incident position is known and it is unlikely that survivors have drifted very far

**Question No.11**

Describe two means of using two vessels in a parallel track search.

1. One vessel will do a parallel track to the left of the possible drift line and the other will do the same but to the right of possible drift line
2. Vessels remain parallel to each other and 1 x track width apart. At end of each leg they will turn together and commence another leg.

**Element 2- Establish and maintain radio-communications**

Describe to your assessor or write a short answer, using diagrams if required, to the following questions.

**Question No.1**

List five radio communication facilities supported in the Australian SRR?

1. MF DSC
2. VHF DSC (channel 70)
3. VHF radiuo telephone (Channels 6, 13, 16 and 67)
4. SART
5. EPIRB

**Question No.2**

What are the 27MHz, VHF and MFHF distress frequencies?

27.88 Mhz (Ch 88)  
156.800 MHz (Ch 16)  
156.525 MHz (Ch 70, DSC)  
156.300 MHz (Ch 6, Aircraft/ship co-ord)  
121.5 MHz (EPIRB & aircraft guard)  
243.0 MHz (EPIRB & military aircraft guard)  
406.025 MHz (EPIRB)  
2182.0 KHz  
2187.5 KHz (DSC only)  
4125.0 KHz  
4207.5 KHz (DSC only)  
6215.0 KHz  
6312.0 KHz (DSC only)  
8291.0 KHz  
8414.5 KHz (DSC only)  
12290.0 KHz  
12577.0 KHz (DSC only)  
16420.0 KHz  
16804.5 KHz (DSC only)  
1530 – 1545 MHz (Immarsat systems)  
1626.6 – 1646.5 MHz (Immarsat systems)

**Question No.3**

What frequency would you use on HF to contact Charleville?

For September 2006 the following maximum usable frequency (MUF) is advised

Day time MUF– 8 MHz (Use 6507 KHz)

Night time MUF – 3 MHz (use 2201 KHz)

Charleville can be contacted for forecasts & warnings

**Question No.4**

What do you understand by “secure” on Police radio?

If VKG or another controlling authority mentions “Secure” or, more likely, “Secure Radio” it means that they have a message which may be sensitive and they don’t want non police or rescue members to overhear it. If there are passengers who may be able to overhear radio, then ask control to “Standby”. Then ask passengers to move to a part of the vessel where they can’t overhear radio before asking control to go ahead with message.

### Question No.5

What are the comparative detection accuracies of 121.5MHz and 406MHz EPIRBs? Why is the later a more preferable EPIRB for distant voyagers in the South Pacific?

121.5 does not send signal to Canberra immediately, rather the satellite has to be in line of sight with the EPIRB and a relay station simultaneously (Bundaberg on east coast of Australia). This may necessitate several passes of the satellite before it is in correct position.

Generally time lag is about 1 hour for Western Pacific & Tasman Sea, out to be about 6 hours for Central Pacific.

406, on the other hand does not require satellite to “see” EPIRB and relay station simultaneously, rather the satellite stores the data from EPIRB and then re-transmits this as soon as it is in line of sight of any relay station in the world. This happens very quickly compared to 121.5 MHz.

Anyone travelling in more remote areas of the Pacific will benefit from 406 because it has a world wide coverage; whereas 121.5 can only be used where a satellite can “see” both EPIRB and relay station simultaneously. Obviously this can only occur aou to a certain distance from land.

### Question No.6

Explain the small craft MAREC report below?

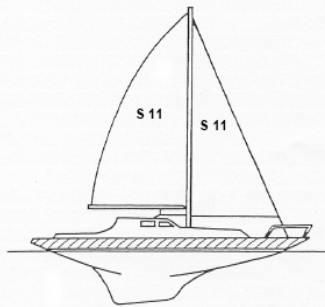


Figure F.13 Complete example: Sailing Boat

**Voice:**

MAREC 8/03, RCC AUSTRALIA  
ALFA, SAILING PART CABIN, FAMILY  
OF MAN, VICTOR KILO SEVEN FOUR  
EIGHT TWO, OFF SHORE RACING  
BRAVO, MAKE PETERSON FOUR  
ZERO, SAIL MARKINGS SIERRA ONE  
ONE  
CHARLIE, MASTHEAD SLOOP RIG  
DELTA, CARVEL, WOOD, BLACK WITH  
WHITE CABIN  
ECHO, FALLING STEM, NEGATIVE  
TRANSOM STERN  
FOXTROOT, KEEL  
GOLF, EIGHT METRES  
HOTEL, PULPIT FORWARD  
INDIA, TWO

**TLX/RTG**

MAREC 8/03, RCC AUSTRALIA  
A/SAILPC/ FAMILY OF MAN/NAVIS  
12/PLEASURE  
B/PETERSON 40/S 11  
C/SLOOP  
D/CARVEL/WOOD/BLACK WITH WHITE  
CABIN  
E/FALL/NTRANS  
F/KEEL  
G/LOA 8  
H/PULPIT FORWARD  
I/2

The vessel is serial # 8/03 assigned by Australian RCC,  
Field A – Type of craft/call sign/use - the vessel is a part cabin passenger vessel with call sign VK7482 and is used for off shore racing  
Field B – Make/distinctive markings - It is a Peterson 40 vessel with distinctive marking – sail # S11  
Field C – Motor and/or rigging - Rigging is masthead sloop  
Field D – Construction/material/colour - It is carvel construction, made of wood and is coloured black with white cabin  
Field E – Type of stem & stern – Falling stem, negative transom stern  
Field F – Type of bottom – Keel  
Field G – Length – 8 metres  
Field H – Other characteristics – Pulpit forward  
Field I – Number of souls on board - 2

### **Element 3-- Assist in search and rescue operations**

Describe to your assessor or write a short answer, using diagrams if required, to the following questions.

#### **Question No.1**

You are on watch on a 12 metre vessel at night when you see a person fall off the starboard bow. Describe the action you would take till the person is safely brought aboard.

Yell out “Man Overboard” (if there is other crew below)  
Push MOB button on GPS  
Throw over life ring, upside down light, dan buoy  
Try to keep victim in sight.  
Crash stop boat by bringing into wind  
Drop sails, start engine and return to victim  
Assist victim back into boat

#### **Question No.2**

List and sketch the most appropriate turns used in a ‘person overboard’ situation.

Williamson turn – Immediate turn 60\* to original track. As soon as turn complete turn opposite way on to reciprocal course of original track. If this is done correctly the vessel should return in its own wake. The commencement of the original 60\* turn should show up as a turn in original wake and may be used as a target by helmsman.

This is overly complex and is usually suited to large vessels with large turning circles. It can take vessel to far away from victim, thus losing sight of him.

Racetrack turn – Consists of an immediate hard 180\* turn on to reciprocal track. Continue past victim, yet keeping him in sight, another 180\* on to original track and return to victim. Although not as complex as Anderson, again could result in loss of sight of victim

Crash stop - This manoeuvre is to stop immediately by turning a sailing craft into wind, or putting engines into reverse for a power craft in order to remain close to victim. Then a return to victim is made.

Recommended for sailing craft, but in a power vessel damage could be done to gearbox by in-experienced helmsman, and danger of reversing into victim.

Anderson turn consists of putting helm hard over and describing a tight circle to return to victim. It is as quick as a crash stop and when done slowly maintains a close contact with victim. This is recommended for small powered craft.

In all above turns the first turn should kick the stern away from victim by turning helm towards side victim went overboard.

The most successful recoveries have been where victim is kept in sight at all times, so when choosing type of turn keep this in mind.

### **Question No 3**

State and sketch the types of search pattern you could use to attempt to find a person overboard.

If LKP can be ascertained by reference to a life ring, GPS etc. then conduct an expanding search pattern.

If LKP not known, maybe because MOB was not noticed at time, then use a creeping line ahead at 90\* to track from present position along reciprocal of track. With longer legs on the downwind or down drift side of the track.

### **Question No.4**

Describe the method that you would use to recover a person from the water on a vessel you are familiar with. Explain why you chose this method.

Using "Paragon" as vessel familiar with.

If MOB conscious and not injured then guide him towards ladder on port aft side of boat. This is an easy way to get on board from out of the water.



If MOB unconscious or unable to climb ladder due to injury, then I would swing boom out over MOB and attach main sheet pulley tackle to life jacket. Then using mainsheet and a winch, I would winch MOB up and swing in. The attachment can be made by holding MOB close to cockpit with boat hook and leaning down to attach tackle to life jacket.

### Question No.5

Your 12 metre single screw vessel has suffered a fractured rudder stock. Describe how you could achieve basic steering control for a slow speed return to harbour.

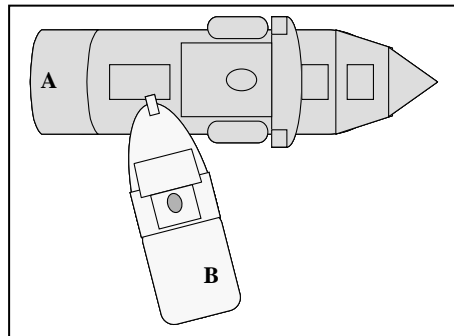
A small amount of steerage can be obtained by balancing head and main sails.

A drogue can be trailed behind vessel attached to centre of transom. This will keep vessel on course. To alter course the drogue can be attached to port or starboard quarter with a lighter line attached between other quarter and the towing line. Altering tension on this line by use of a winch will steer boat port or starboard.

An emergency rudder can be fashioned out of a spinnaker pole and a washboard.

### Question No.6

In the diagram below Vessel B has pierced the hull of Vessel A and it is clear that the engine room and two other compartments are going to flood. Discuss as Master of Vessel B, what action you will take?



Securely fasten both sides of bow of B to starboard side of A to stop vessels pulling apart. Check for any crew that may have been thrown into water. Check injuries, radio for assistance. Have pumps manned.

### Question No.7

List the legal requirements when involved in a collision?

Exchange names of vessels

Notify each other of ports of registry, departure and destination

Enter a witnessed statement in log book or record book

Notify authorities at earliest or within 48 hours. If death, injury or damage more than \$100 then it is 24 hours.

**Question No.8**

Your vessel has grounded for about ½ her length on a gently sloping sandbar. The vessel has full ballast tanks fore and aft. Discuss your actions in the use of ballast and engines to refloat the vessel.

In first instance use engines, but only for a short while as this may cause a build up of silt around forward part of hull.

If vessel does not come off straight away it is probably due to a suction effect between part of bow on sandbar and the sand. To alleviate this reduce ballast in aft part of hull this will lift vessel off of sandbar at bow using a leverage principal. After suction has been alleviated engines will probably draw vessel off.

**Question No.9**

What would be the problems of trying to refloat the vessel with engines alone?

Build up of sand along section of hull on sandbar.

**Question No.10**

What immediate action is necessary on board a vessel that has 'grounded'?

Sound alarm

Stop engines

Account for personnel and injuries

Check for hull damage

Check extent of grounding using a lead line and ascertain where deep water lies.

Check type of bottom from chart.

Check tide and tidal stream

**Question No.11**

Describe the usual symptoms of a propeller fouled by rope or wire. What measures can be taken to clear the propeller?

Engine may stall, it may snap shaft, if so it will over rev suddenly,

Sometimes fouling can be cleared by going astern. If not then a diver may have to go down to clear it. The stern of vessel can be raised by shifting ballast to aid diver.

**Question No.13**

You have struck a floating obstruction, holing your forepeak on one side, 0.2 metres below the waterline. The hole is nearly 1 metre long. What means would you use to make temporary repairs?

Use of a sail dragged around the hull and over the damage.

Plug hole with cushions etc.