Most emergencies afloat can be avoided by good sea skills, planning and preparation - but not all. If you’re facing a dangerous situation, you need to act quickly and, if warranted, raise the alarm to give rescuers the greatest chance of success.

This chapter discusses common emergency and first aid situations at sea, distress signals, and Australia’s search and rescue system. It also covers your obligations to respond to requests for assistance from other vessels – long-held tradition of the sea.
Your obligations

As the boat operator you have legal obligations if your vessel is involved in an incident, someone is hurt or if you witness an incident.

If your vessel is involved in an incident you must stop and follow these steps:

- Help as much as you can, without putting yourself, your passengers and/or your crew at risk.
- Exchange your contact details with the operator of any boat involved, any injured person and/or the owner of any damaged property.
- If the incident has resulted in death, injury requiring medical attention, or damage worth more than $300 you are obligated to submit a completed Vessel Accident Report form to a DPTI Marine Safety Officer or to your nearest police station within 48 hours of the incident.

The Vessel Accident Report form must include the:

- time and place of the incident;
- circumstances (a description of the incident—a diagram may help);
- name and address of any person killed or injured;
- names and addresses of any witnesses; and
- nature of property damage.

Whenever you’re not using your marine radio, it should be set to the relevant distress frequency for the type of radio carried (refer chapter 7) with the volume and squelch set for you to clearly hear any calls for help. It is a long-standing maritime tradition to respond to requests for assistance, though they may not necessarily be emergencies. If you hear a mayday call and a coast station doesn’t answer, try to relay the message and then assist if possible.

You’re not obliged to tow other vessels, but you can offer to stand by until help arrives.

Insurance

Although recreational vessel insurance is voluntary, owners are encouraged to take out some form of cover. Third-party insurance is particularly important, as claims for personal injuries or damage caused to property can be significant.

Marine insurance cover can be arranged through insurance companies or brokers.

Common situations

If you’re faced with a dangerous situation, the following common-sense steps will help reduce the risk of vessel or property damage, as well as personal injury or even death:

- As the skipper, take control of the situation and try to keep crew and passengers calm.
- Identify the type of situation you’re faced with and how it can be managed.
- Remind everyone on board of where the safety equipment is and how to use it.
- If there’s a fire, try to put it out. Similarly, if your vessel is taking on water, use your bailer or pump.
• If the situation can’t be controlled:
  – use a torch or flare to attract attention from passing vessels or people on shore (refer to Distress signals in this chapter);
  – if carrying a V distress sheet, secure it in a visible place, either on top of or trailing behind the vessel;
  – transmit a mayday call if in grave and imminent danger, or a pan-pan message if you need less urgent assistance;
  – activate your EPIRB if you can’t attract help using other methods.

The types of emergencies you are most likely to face on the water are:

**Capsizing**
A capsize can happen because of high speed, rough seas, surf, high wind, inexperience, or stupidity—and it can happen in seconds.

When lifejackets are not required to be worn they should be readily accessible, however it is recommended that you always wear an approved lifejacket when on board a vessel. Once everyone has been accounted for, stay huddled together and stay with the vessel, as rescuers will more easily spot it than you.

**Engine failure**
Even the best maintained engine can fail, so it is important to have some basic knowledge of how to re-start it and to always carry a kit of essential tools.

Become familiar with the sound of an engine so that you can easily detect that an engine is not running normally. You may then be able to take action before a complete breakdown happens.

If the engine does fail, use an anchor to stop the vessel drifting and keep the bow facing into the sea. This action, plus use of a well-maintained waterproof cover (such as a tarpaulin), can help keep the ignition dry and make re-starting the engine easier.

**Fire**
The most important factor in preventing most vessel fires is the safe handling of fuel, which involves:

• well-maintained fuel equipment
• correct use of refuelling equipment
• keeping any ignition sources well clear, such as pilot lights and lit cigarettes
• taking appropriate care.

If you smell any petrol or gas fumes, check where they’re coming from and why. Other common sources of vessel fires include heating appliances, stoves, gas or fuel leaks or cooking fat.

The three elements of fire are fuel, heat and air (oxygen). If brought together in sufficient quantities, a fire will start. Remove any one element and the fire will go out. Fire extinguishers work by cooling (removing the heat) or smothering (removing the air).

For information on the different types of extinguishers refer chapter 4, Safety equipment, Standards and features.
Fighting a fire

Fuel and gas fires can spread very quickly and even a minor spill can create an almost explosive spread of flames. You need to act quickly but calmly, taking the following steps:

- Raise the alarm to everyone who is onboard and to rescue organisations.
- Make sure everyone on board is wearing an approved and correctly fitted lifejacket.
- If safe, manoeuvre the vessel to shield the fire from wind (generally downwind). This should help curb the spread of flames.
- If the fire is in an enclosed space, close all the hatches, vents and ports to reduce the supply of oxygen to the fire.
- If a burning object can be safely moved, put it over the side quickly, but away from any other vessel or flammable object.
- Shut off fuel and gas lines.
- Try to put out the fire; if using an extinguisher, point it at the fire’s centre, not flames.
- Once the fire is out, keep a watchful eye for re-ignition.
- If you need to abandon the vessel, don’t get off the vessel on the leeward (downwind side); the vessel may drift on to you or any fuel may spread towards you in the water.

Assisting when another vessel is on fire

A large black smoke pall on the water is an indication of a fire on another vessel. While it is important to assist, be very cautious as you approach and keep to the vessel’s windward side.

Person overboard

Don’t jump in after someone who has fallen overboard—that only doubles the problem. Instead you should:

- remain calm and don’t panic
- throw a lifebuoy, lifejacket or other buoyance aid to the person
- delegate someone to keep the person in sight at all times
- at night, illuminate the area using the best available light
- steer the vessel as if to pass within one metre of the person
- when the person is opposite the bow, select neutral and turn the vessel away from the person (for dinghies, point the tiller at the person)
- approach the person from downwind
- once the person is being held, switch off the engine to reduce risk of injury
- bring the person in over the stern—not the side—to avoid a capsize
- if you don’t have a boarding ladder, you can make one with rope
- help the person back on board, and have someone look after them—they may be hurt, exhausted, or cold.

It is advisable to practise this procedure with your crew members before you head out, so if someone needs to be rescued, it can happen quickly and efficiently.

Running aground

Grounding is very common, especially in areas with lower than usual water levels or new sand or silt build-up. Fortunately, in many cases grounding results in minimal damage or personal injury, however any damage or personal injury usually depends on your vessel’s speed and the type of surface you run on to.
Chapter 9. Emergency action

The following actions can help you to prevent grounding:

- Know where you should be and where you actually are when you are on the water.
- Keep a constant lookout.
- Use a chart of the waters you’re operating in and tide table to plan your trips.
- During the trip, refer to the chart and tide table to estimate water depth.
- If you have one, a depth sounder can reduce the risk of grounding.
- Identify all navigation marks (remember not all are lit at night).
- Slow down if you are not sure of something.

If you do run aground:

- check the welfare of your crew and/or passengers
- call for medical assistance if required
- assess the vessel for leaks and other damage
- if you have an outboard or sterndrive engine, check for propeller damage; for other engine types you may need to wait until you are back on land unless it is safe for you to jump overboard to inspect the propeller
- if the vessel seems workable, check for depth of water around the vessel by probing with a boat hook or even getting over the side
- assess your options, which include:
  - pushing off
  - waiting for the tide to rise
  - calling for assistance if your vessel is unseaworthy or hard aground.

Abandoning your vessel

If you are forced to abandon your boat, take the following action:

- Ensure everyone is wearing an approved and correctly fitted lifejacket before going over the side (lifejackets are difficult to put on in the water)
- Ensure any life rafts or lifebuoys are ready for use.
- If possible, send a distress message on your marine radio.
- Use flares only if there is a reasonable likelihood of them being seen. Otherwise keep them for when rescue craft are visible.
- Activate your EPIRB if you have one.
- If the vessel is likely to stay afloat, or partially afloat, deploy the vessel’s anchor to stop it drifting too far.
- Carry as much fresh water with you as safely possible.
- If possible, use the boat as a means of support and stay with it. Most boats involved in incidents don’t sink and are easier to see than people are.
- Resist the impulse to swim ashore, unless you know for certain that land is within swimming distance.
- Huddle together by forming a tight circle with arms around each other to reduce heat loss.
- Avoid excessive physical activities such as swimming because this increases body heat loss.
## Distress signals

These internationally recognised signals indicate distress and need of assistance. It is an offence to misuse these signals.

<table>
<thead>
<tr>
<th>Signal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rockets or shells throwing red stars, fired one at a time at short intervals</td>
<td></td>
</tr>
<tr>
<td>Morse code SOS, using light or sound. Radio signal: ‘Mayday, mayday, mayday’</td>
<td></td>
</tr>
<tr>
<td>Square flag with a round ball or anything ball-shaped above or below it</td>
<td></td>
</tr>
<tr>
<td>Rocket parachute flare or hand-held red flare</td>
<td></td>
</tr>
<tr>
<td>Orange smoke signal</td>
<td></td>
</tr>
<tr>
<td>Slowly and repeatedly raising and lowering your arms outstretched to each side</td>
<td></td>
</tr>
<tr>
<td>Rectangle of international colour orange with black letter ‘V’</td>
<td></td>
</tr>
<tr>
<td>Rectangle of international colour orange with black square and circle</td>
<td></td>
</tr>
<tr>
<td>Dye marker</td>
<td></td>
</tr>
<tr>
<td>International code signal of distress: N over C (November Charlie) flags</td>
<td></td>
</tr>
<tr>
<td>EPIRB signal</td>
<td></td>
</tr>
</tbody>
</table>

## Example marine radio calls

### Distress call

<table>
<thead>
<tr>
<th>Signal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mayday, mayday, mayday</td>
<td></td>
</tr>
<tr>
<td>This is ...........</td>
<td></td>
</tr>
<tr>
<td>Scamp VL2345, Scamp VL2345</td>
<td></td>
</tr>
</tbody>
</table>

### Distress message

<table>
<thead>
<tr>
<th>Signal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mayday</td>
<td></td>
</tr>
<tr>
<td>Scamp VL2345</td>
<td></td>
</tr>
<tr>
<td>20 nautical miles due west Carpenter Rocks</td>
<td></td>
</tr>
<tr>
<td>Sinking rapidly after striking submerged object. Estimate further 15 minutes afloat</td>
<td></td>
</tr>
<tr>
<td>20-metre motor cruiser, red hull, white superstructure, four people on board, EPIRB activated</td>
<td></td>
</tr>
</tbody>
</table>

### Urgency call

<table>
<thead>
<tr>
<th>Signal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pan, pan, Pan, pan, Pan, pan</td>
<td></td>
</tr>
<tr>
<td>Hello all stations, Hello all stations, Hello all stations</td>
<td></td>
</tr>
<tr>
<td>This is ...........</td>
<td></td>
</tr>
<tr>
<td>Hawk VL2345</td>
<td></td>
</tr>
<tr>
<td>Hawk VL2345</td>
<td></td>
</tr>
</tbody>
</table>

### Urgency message

<table>
<thead>
<tr>
<th>Nature of situation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 nautical miles due west of Cape Borda, lost propeller, estimate drifting southwest at 3 knots, require tow urgently</td>
<td></td>
</tr>
</tbody>
</table>
### Safety call

<table>
<thead>
<tr>
<th>Signal (state three times)</th>
<th>Say-cure-e-tay, say-cure-e-tay, say-cure-e-tay,</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station called (state three times)</td>
<td>Hello all stations, hello all stations, hello all stations,</td>
</tr>
<tr>
<td>Your call sign or vessel name (state three times)</td>
<td>This is ............</td>
</tr>
<tr>
<td>Change of frequency</td>
<td>Navigational warning, listen on 2524</td>
</tr>
<tr>
<td>Vessel station changes to working frequency and calls again</td>
<td></td>
</tr>
</tbody>
</table>

### Activating an EPIRB

**To activate your EPIRB you need to:**
- take the device from its cradle
- raise the antenna
- activate the switch
- attach the device by its lanyard to the life raft, your lifejacket or your vessel if that will stay afloat
- throw the device into the water and allow it to drift away from you.

If possible you should also try to keep a flare(s) available to help searching boats and aircraft to pinpoint you.

If you accidentally activate your EPIRB, switch it off and immediately notify the Rescue Coordination Centre Australia (RCC Australia) (refer chapter 13, Contact details & further information). If accidental activation occurs onboard and you can’t make a phone call, contact a volunteer marine rescue group via marine radio to notify RCC-Australia on your behalf. There is no penalty for accidental activations however misuse of an EPIRB is an offence.

It is important to correctly dispose of an unwanted EPIRB so they do not accidentally activate and cause unnecessary searches. (refer chapter 13, Contact details & further information).
Activating flares

This section contains general instructions for using flares, however you should be aware that brands may differ in their firing methods. Carefully follow the manufacturer’s instructions for use of flares, as a misfire can cause injury.

It’s an offence to misuse flares, or to activate a flare for ‘practice’. Some volunteer marine rescue groups hold authorised demonstrations and these are recommended if you’re unsure how to use your flares.

All marine flares must be approved to Australian Standard AS 2092.

The three types of flares and their operation are:

**Parachute (rocket flare—red)**

Parachute flares can reach a height of 300 m and can be seen for up to 40 km at night and 15 km by day.

**Orange smoke flare**

Orange smoke flares are visible for up to 4 km and 10 km by aircraft. They are for daytime use only. For identification, the end cap has a raised ‘O’.

The same steps apply to operating the red and orange hand-held flares.

**Red hand-held flare**

Red hand-held flares can be seen for up to 10 km. They are designed for use at night, but can also be seen during the day. For easy identification in darkness, the plastic end cap has a raised ‘+’.
First aid afloat

Every vessel should carry a suitable first aid kit, which can be bought from specialist organisations such as St John Ambulance or Australian Red Cross (these organisations also run first aid courses). The kit should contain adequate wound and burn dressings and a booklet explaining basic first aid procedures.

Chemists stock simple kits that can be supplemented with sunscreen lotion, seasickness tablets, a felt-tip pen (for recording injuries and treatment, to inform medical staff if necessary) and a pair of side-cutting pliers for removing fishhooks. Clearly mark the kit as first aid and keep it in a sturdy, watertight container where anyone on board can reach it.

Bites and stings

Bites or stings from sea snakes, blue-ringed octopus and some jellyfish can cause breathing and circulation problems.

It is vital in all of these instances to keep the patient calm, assured and rested, monitor their airway, breathing and circulation (ABC) and get medical help urgently.

If necessary in the most serious cases, you may also need to begin resuscitation immediately and continue until medical help arrives.

The following steps are also recommended for particular bites and stings.

Jellyfish

- Prevent patient from rubbing the area.
- Pour vinegar over the affected area to deactivate the stinging capsules and prevent further venom release.
- Apply icepacks to relieve pain.

Blue-ringed octopus and sea snakes

- Apply a pressure immobilisation bandage to the affected limb.

Stingrays and other venomous spines

- Immerse area in water as hot as the patient can tolerate, to help relieve the pain.
- Don’t use pressure bandages (i.e. tourniquets).

Bleeding

Small cuts can be treated easily by washing with a disinfectant solution and closing with a suitable dressing.

The most effective way to stop bleeding is to apply pressure directly to the wound. Elevating the limb also will help control bleeding.

If a patient is bleeding severely due to a significant accident such as a propeller strike, you may have to apply a constrictive bandage as a last resort, but more standard bandaging is preferable.

- Use a broad (5-7.5 cm wide) soft rolled bandage, strip of material or wide belt.
- Apply the bandage to the upper part of the limb to completely cover the arterial pulse, but keep clear of limb joints.
- Encircle the limb several times.
- If bleeding appears to increase, slowly release the bandage as this reduces the risk of a surge of blood and then reapply immediately.
- Once the bandage is correctly applied, record the time on the patient’s forehead.
- The bandage must not be covered up by clothing.
- Transport the patient to hospital as soon as possible.
Burns
Immediately and gently cool the burned skin with plenty of cold water (sea water is excellent). Never burst blisters or cut away clothing unless it’s a chemical burn, which might continue to eat into the clothing and skin beneath.
Cover the area lightly with a clean, dry, sterile burns dressing or clean cloth, and keep the patient calm and assured. Seek medical assistance as soon as possible.

Hypothermia
Hypothermia is a serious medical condition resulting from heat loss due to prolonged immersion in water or insufficient protection in cold, wet or windy conditions, so it’s particularly relevant to boaties.
The loss of core body temperature in vital organs such as the heart, lungs and kidneys can cause death quickly. The risk is increased if the person is anxious, hungry, exhausted or mentally low.

Hypothermia is not always easy to recognise. The person may no longer feel cold which can disguise the real risk. Early signs of hypothermia may include:
- lethargy and difficulty in reasoning
- poor sense of touch and clumsiness
- slurred speech
- developing muscle rigidity
- swollen lips, hands and feet.
As the condition develops, more critical symptoms include:
- rigid muscles
- very slow, weak pulse and breathing
- uneven heartbeat
- unconsciousness
- cold and bluish-grey skin
- dilated and unresponsive pupils
- death-like appearance.

Minimising the risks
To reduce the risk of hypothermia:
- keep warm and dry
- avoid fatigue by resting if you are tired
- eat and drink normally to prevent dehydration
- avoid alcohol as it increases the pulse rate and increases body heat loss
- avoid seasickness
- be aware of special medical needs.
To slow the development of hypothermia in the water:
- put on extra clothing before entering the water but be careful to choose clothing that won’t absorb water and weigh you down too much
- protect the head, neck, hands, feet, chest and groin from heat loss
- minimise swimming and strenuous activity
- adopt the heat escape lessening posture (HELP).
Treatment

Careful treatment of a person with severe hypothermia is crucial and involves the following steps:

- Do not massage their skin.
- Shelter them in a warm environment away from wind and cold.
- Replace wet clothes with dry.
- Keep them horizontal and in the ‘shock’ position (on their back, with legs bent and raised), and encourage them to minimise their movement.
- Restore core temperature gradually - the body's shock at too-rapid warming can kill.
- Share body warmth with them.
- Breathe across their mouth and nose.
- Apply gentle warmth to head, neck, chest and groin.
- Give warm sweet drinks (not alcohol), if conscious.
- Administer cardiopulmonary resuscitation (CPR) if necessary.
- Seek medical advice.
- Keep them under continuous observation.

Exposure

To prevent exposure to the elements, you should take note of the following.

- It’s colder out on the water, so take extra jumpers and waterproofs.
- The sun reflecting off the water makes its effects stronger, so apply sunscreen regularly.
- Carry adequate wet weather gear for your planned trip.
- Wear clothing that will protect you from the elements (wind, water and sunlight).
- Wear clothing that will not restrict your movements.
- In shallow water and if possible before you go boating, test your ability to swim or float in your clothes, but make sure you have a spare set with you.

Sun exposure

Boaties are particularly susceptible to ultraviolet (UV) radiation from the sun, because of the additional radiation reflecting off the water. UV radiation is present during daylight all year, but is strongest between 11 am and 3 pm during daylight savings time (10 am to 2 pm other times).

Clothing offers the best sun protection: wear a long-sleeved shirt and a hat that covers the face, ears and neck (a dark colour under the brim will help reduce glare off the water). Also apply to exposed skin a water-resistant, broad-spectrum sunscreen with a sun protection factor (SPF) of at least 15+ and a lip sunscreen. Apply the sunscreen 20 minutes before going out and reapply it every two hours. For further information, contact the Cancer Council South Australia, (refer chapter 13).

To treat serious sunburn, apply a cool, moist compress to the affected area but do not break any blisters. Give plenty of fluids and seek medical attention quickly.

Seasickness

Seasickness can be avoided in many cases if you sleep aboard the vessel the night before, to let your body get used to the motion. Of course, this is not always possible.

Otherwise, you can take seasickness tablets as advised by a doctor or chemist, but be aware that some may make you drowsy. Experienced sailors keep their diet free of rich, fatty foods and alcohol both before going to sea and while aboard.

If you feel seasick, keep busy and stay in the fresh air, away from enclosed areas where fuel fumes and food odours may collect. Avoid the ‘head down’ position, as this aggravates illness. Nibble on a dry biscuit, or chew barley sugar or dried fruit. Ginger is also considered a good remedy.
Search and Rescue (SAR)

National coordination

The Rescue Coordination Centre (RCC-Australia) is responsible for coordinating all aviation and maritime Search and Rescue (SAR) in Australia. It also operates the Australian ground segment of the Cospas–Sarsat distress beacon detection system and broadcasts maritime safety information.

RCC-Australia, part of the Australian Maritime Safety Authority (AMSA), is staffed by SAR specialists and operates 24 hours a day.

Technology such as the EPIRB has taken some of the guesswork out of SAR in Australia, but RCC-Australia is still alerted to emergency incidents through such traditional means as ‘mayday’ radio calls, flares and phone calls from concerned relatives and friends.

Once alerted to an emergency, RCC-Australia may call for assistance from a wide range of sources which includes:

- Volunteer Marine Rescue (VMR) groups
- the shipping and fishing industries
- state police and other emergency services
- defence forces
- airlines and trained aviation organisations
- emergency medical helicopters
- the Australian Communications and Media Authority (ACMA).

RCC-Australia’s 24-hour emergency maritime search and rescue telephone number is 1800 641 792.
South Australian coordination

The South Australia Police (SAPOL) is responsible for sea search and rescue in the state and are supported by volunteer marine rescue groups and other South Australian Government agencies.

SAPOL Water Operations Unit personnel are trained in the latest technology for search and rescue planning and have access to a state-wide database of appropriate resources and information.

Police can assist you with any marine emergency or general enquiry, contact details are:

- **SA Police Water Operations**
  Telephone: (08) 8242 3466

- **Police attendance**
  Telephone: 131 444

- **Crime Stoppers**
  Telephone: 1800 333 000

- **For life-threatening emergencies**
  Telephone: 000

Rescue by helicopter

A helicopter is a quick and efficient means of rescuing injured or stricken people at sea.

It is preferable for a helicopter to perform a winching operation into the wind. For easier and safer recovery your vessel should, if possible, be underway and steering a little across the relative wind line. This will allow the helicopter to line up on the vessel, giving the pilot and crew better visibility and ensuring any downwash lies behind the vessel and aircraft.

Before the arrival of the helicopter, all loose articles above deck should be securely stowed or lashed down, and a clear area prepared. To make a rescue, the helicopter must maintain its position over the target.
Towing a vessel

Towing a vessel usually requires a high level of skills and experience, especially in rough conditions.

Before towing, ask yourself the following questions:
- Is there an alternative to towing?
- Is the tow within my vessel’s capability?
- Do I have enough fuel?

To set up the tow:
- designate one person in control, this is normally the skipper of the towing vessel
- establish communication signals, preferably radio, but agree on hand signals as a back-up
- ensure the towline is
  - strong enough
  - long enough (preferably at least 2.5 times the wave spacing)
  - secured to strong points on both vessels
  - protected from chafing
  - easily slipped from either vessel, if required
  - flexible, with some elasticity (don’t use chain)
- ensure the towing vessel’s steering is not hampered; attach the towline forward of the rudder or engine on the towing vessel or set up a bridle
- ensure the towed vessel is trimmed by the stern and is steered, or its steering is fixed.

If the towed vessel yaws heavily (swerves off course), try:
- changing course or speed
- trimming the towed vessel further aft
- fixing the towed vessel’s steering at an angle
- streaming a drogue, or sea anchor, from the towed vessel; or
- attaching another vessel astern of the tow.

For better control in confined waters, shorten the tow or tow alongside your vessel (well aft to ensure good steerage).

Chapter 9.
Self-check questions

1) If an emergency forces you off your vessel but the vessel stays afloat, which of the following actions is recommended?
   A. Try to swim ashore if you think you know which is the correct direction.
   B. Stay with the vessel, as it’s easier to see for a rescuer.
   C. Swim around to try and stay warm.

2) If someone falls overboard after you’ve switched the engine off, over which part of the vessel should you help them back on board?
   A. The side opposite to the wind direction.
   B. The side offering best protection from the waves.
   C. Put a ladder over the bow (front) of the vessel.
   D. The stern of the vessel, as it is most stable.

3) Once someone who’s fallen overboard has been brought back onto the boat, which of the following actions should you take to help their recovery?
   A. Give them a warm, sweet drink.
   B. Get them into dry clothes.
   C. Rub their skin to warm them up.
   D. All of the above.
   E. Both A and B.