



RV POLARSTERN

**Scientist
Training Manual**

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1 General safety rules and instructions

Dear crewmember,

welcome on board! In the very beginning of your stay on board you will or already have received several instructions throughout the shipboard safety familiarization and you will or already have participated in a mandatory drill. This manual picks up the initial safety instructions and enhances them with further information.

Please do not hesitate to enquire further information that you might think necessary or in case of any remaining questions.

Sources of safety relevant information:

- STCW-course trainings on basic safety, survival crafts, crowd and crisis as well as fire-fighting
- Shipboard safety familiarization
- Muster list
- Safety information poster in your cabin
- Fire control and safety plan
- Safety drills you participate
- Shipboard procedures of all scientific gear on board
- The “Networked Videotel On Demand”- training program
- Crew training manual
- Verbal or written instructions and announcements
- Your safety officer or any other crew member
- Intranet

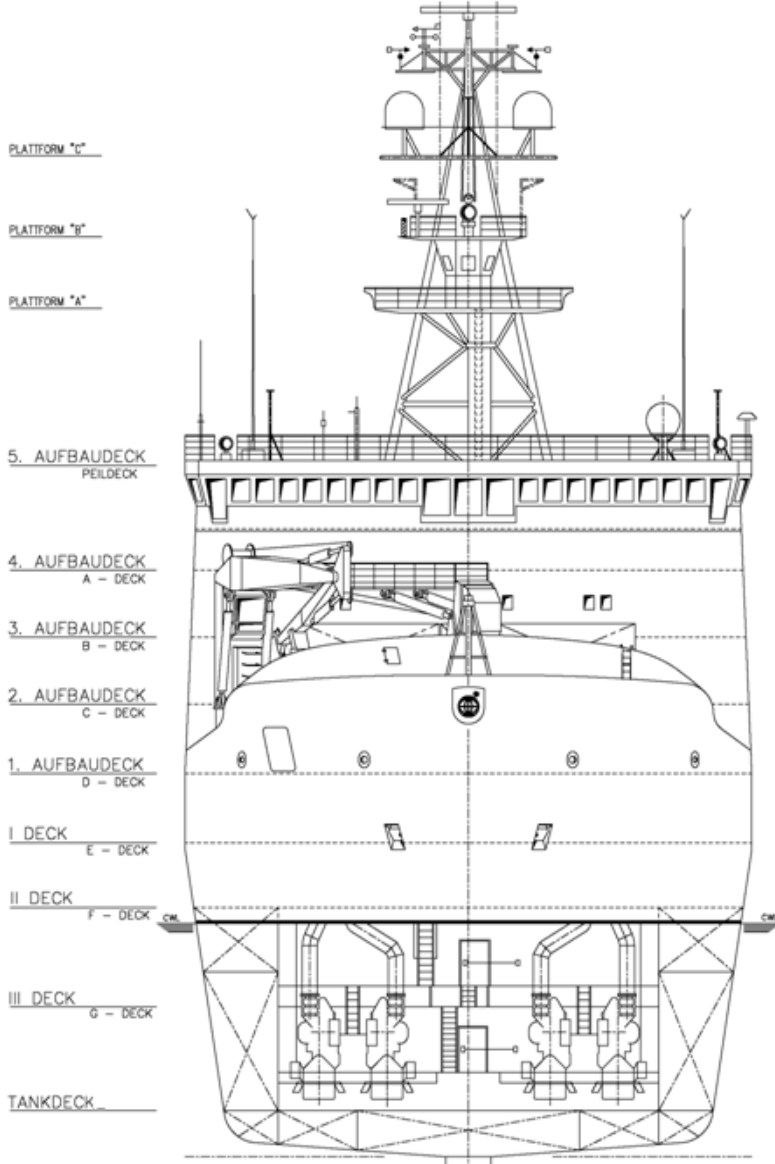
For your time on board please note the **three basic principles of ship's safety:**

Prevention of accidents, fire and other contingencies has highest priority.

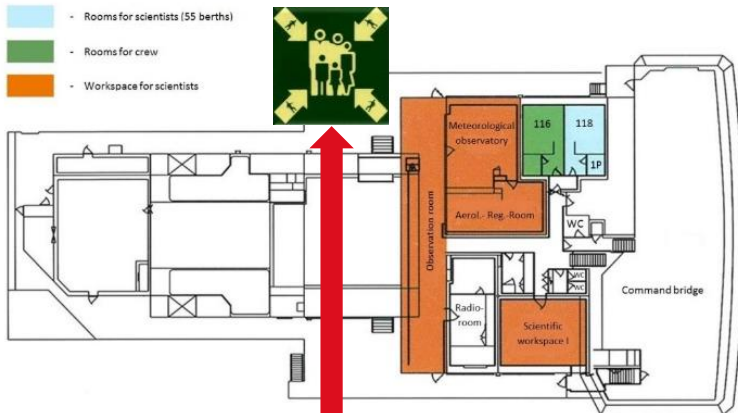
Always use one hand for your work and one for your own safety.

Drugs are strictly prohibited on board
– Never work intoxicated by any substance

RV Polarstern – Overview

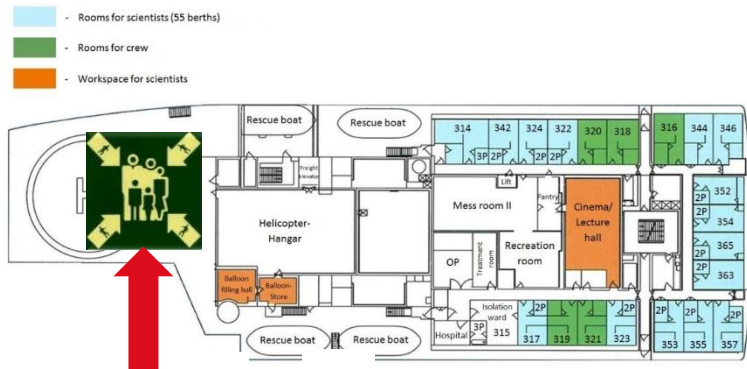


Deck A
4th superstructure deck



Crew's muster station in case of general alarm (evacuation team excluded)

Deck C
2nd superstructure deck



Evacuation team's muster station in case of general alarm

2 Muster list and emergency instructions

Roles of the crew and scientists as well as their behaviours are exactly regulated in the muster list.

The rules in case of an emergency, information and distribution of tasks concerning the abandonment of the ship and the general alarm can be found in the muster list. The muster list is displayed on all accommodation decks, bridge and ECR of the ship within showcases (see figure aside).



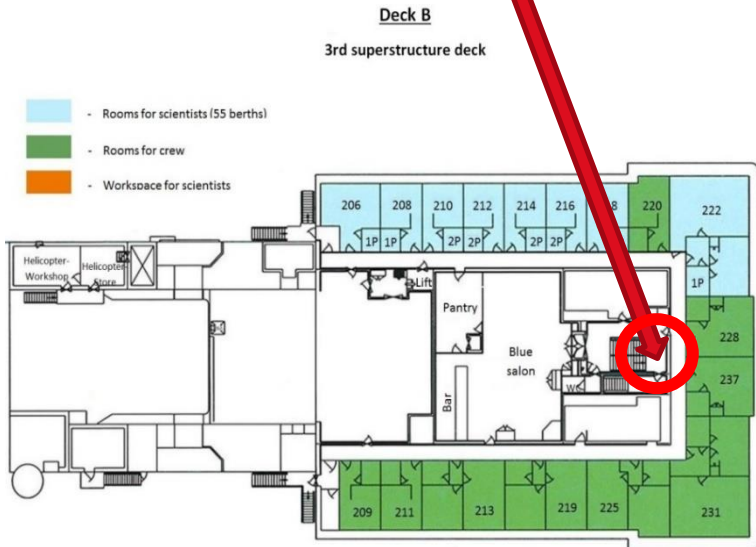
Showcases include:

- The recent **muster list**, with the tasks and muster stations of the crew in case of a general alarm, in case of an abandon ship alarm and in case of a person overboard.
- The supplement to the muster list, with the **distribution of the scientific cruise participants to the lifeboats 1-4**, their cabin- and telephone numbers.
- Instructions on how to behave when abandoning the ship in an emergency at sea.
- The responsibilities in the event of oil spillage (Oil Spill Response Team).

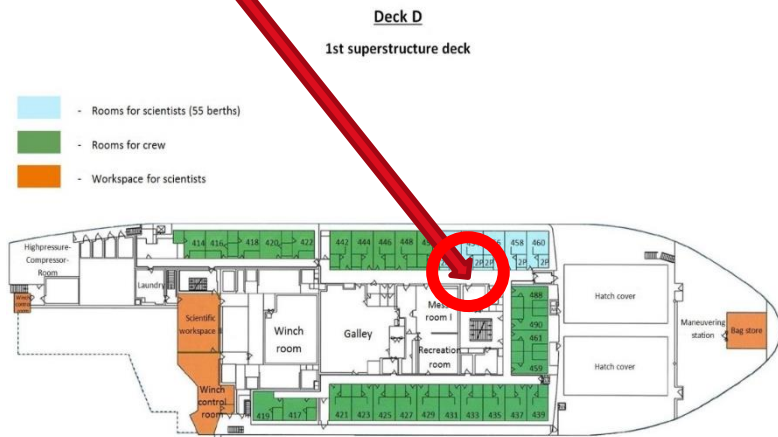
Always remember your designated lifeboat number!

You can find the muster list on each accommodation deck, e.g.:

On **B-Deck** in the staircase: Escalating the stairs, the muster list is situated right hand side



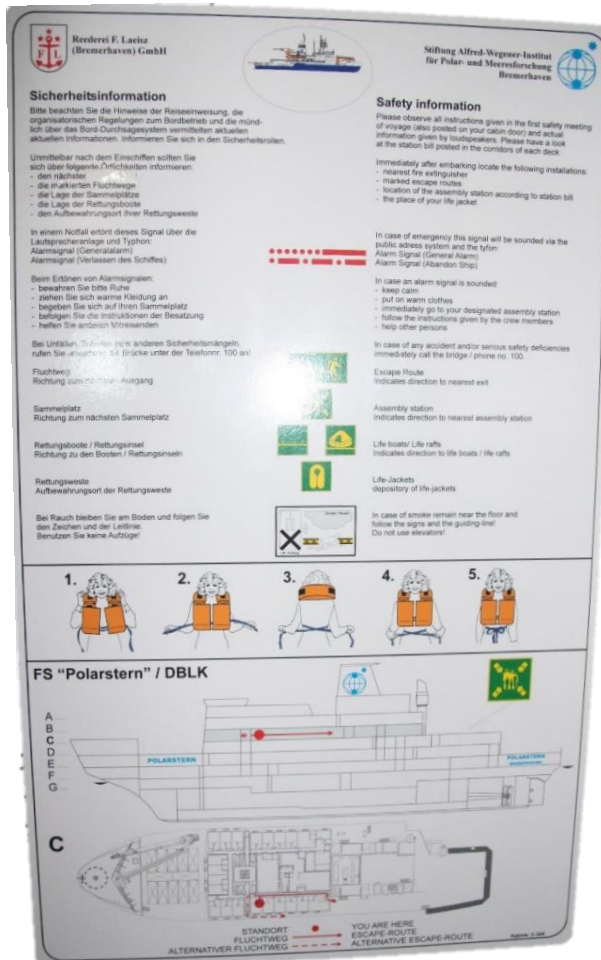
On **D-Deck** on the PS-Alleyway: Leaving Mess Rm. 1 heading forward



3 Cabin's safety information poster

In all cabins safety information posters can be found, usually at the bathroom door. Here you will find some general safety information and the request to get familiar with your cabin's surroundings as well as with your escape route.

Learn your initial emergency behaviour!



Sicherheitsinformation
Bitte beachten Sie die Hinweise der Reiseanweisung, die organisatorischen Regelungen zum Bordbetrieb und die mündlich über die Bord-Durchsageanlage erteilten aktuellen Informationen. Informieren Sie sich in den Sicherheitsrollen.

Unmittelbar nach dem Einschiffen sollten Sie sich über folgende Pflichtkarten informieren:

- den nächster
- die markierten Fluchtweg
- die Lage der Sammelplätze
- die Lage der Rettungsboote
- den Aufbewahrungsort Ihrer Rettungsweste

In einem Notfall ertönt dieses Signal über die Lüftungsanlage und Typdon:
Alarmsignal (General Alarm)
Alarmsignal (Verlassen des Schiffes)

Beim Eintönen von Alarmsignalen:

- bewahren Sie volle Ruhe
- ziehen Sie sich warme Kleidung an
- begeben Sie sich auf Ihren Sammelplatz
- befolgen Sie die Instruktionen der Besatzung
- helfen Sie anderen Mitreisenden

Bei Unfällen, Stürzen, etc. anderen Sicherheitsmängeln, rufen Sie umgehend 54 Brücke unter der Telefonnr. 100 an!

Fluchtweg
Richtung zum nächsten Ausgang

Sammelplatz
Richtung zum nächsten Sammelplatz

Rettenungsboote / Rettungsinsel
Richtung zu den Booten / Rettungsinseln

Rettungsweste
Aufbewahrungsort der Rettungsweste

Bei Rauch bleiben Sie am Boden und folgen Sie den Zeichen und der Leuchte.
Benutzen Sie keine Aufzüge!

Safety information
Please observe all instructions given in the first safety meeting of every leave posted on your cabin door and actual information given by loudspeakers. Please have a look at the station bill posted in the corridors of each deck.

Immediately after embarking locate the following installations:

- nearest fire extinguisher
- marked escape routes
- location of the assembly station according to station bill
- the place of your life jacket

In case of emergency this signal will be sounded via the public address system and the typhon:
Alarm Signal (General Alarm)
Alarm Signal (Abandon Ship)

In case an alarm signal is sounded:

- keep calm
- put on warm clothes
- immediately go to your designated assembly station
- follow the instructions given by the crew members
- help other persons

In case of any accident and/or serious safety deficiencies immediately call the bridge / phone no. 100.

Escape Route
Indicates direction to nearest exit

Assembly station
Indicates direction to nearest assembly station

Life boats / Life rafts
Indicates direction to life boats / life rafts

Life jackets
depository of life jackets

In case of smoke remain near the floor and follow the signs and the glowing level.
Do not use elevators!

FS "Polarstern" / DBLK

A
B
C
D
E
F
G

C

STANDORT
FLUCHTWEG
ALTERNATIVER FLUCHTWEG

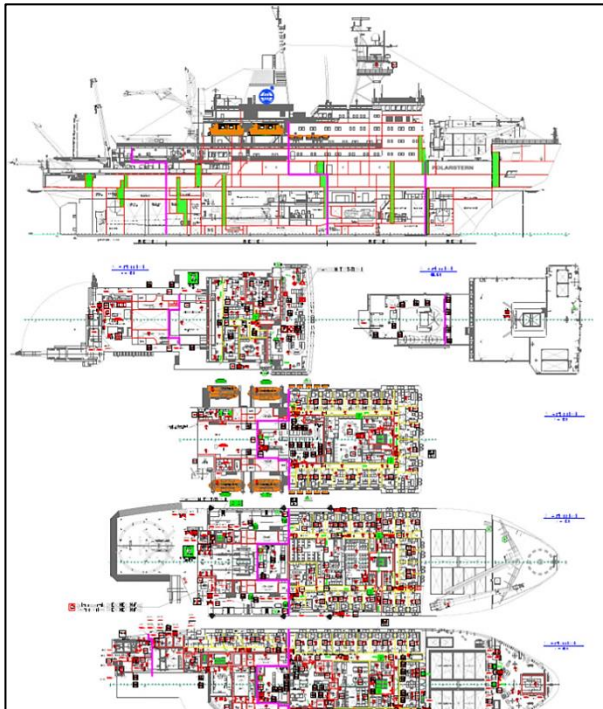
YOU ARE HERE
ESCAPE ROUTE
ALTERNATIVE ESCAPE ROUTE

4 Fire control and safety plan

The safety plan lists and indicates visually all safety relevant installations and equipment.

Please familiarize yourself with the location of:

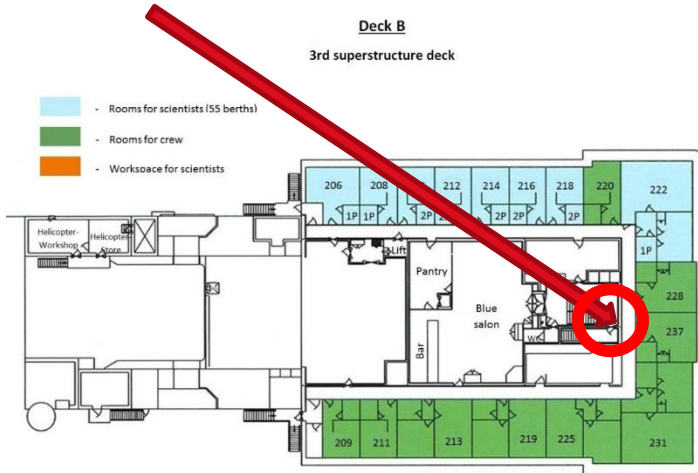
- Safety equipment
- Escape routes and emergency exits
- Manual fire call points
- Next portable fire extinguisher close to your cabin



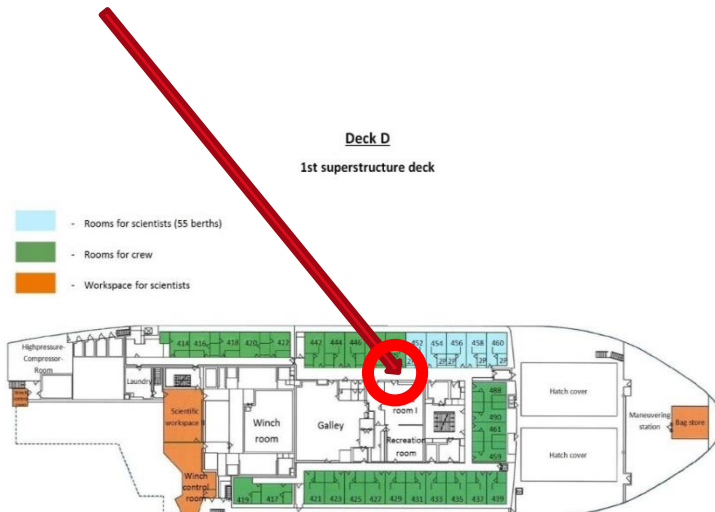
Get familiar with your surroundings!

You can find the fire- and safety plan at several locations, e.g.:

On **B-Deck** in the staircase: Escalating the stairs, the muster list is situated right hand side.



On **D-Deck** on the PS-Alleyway: Leaving Mess Rm. 1 right in front of the door.



5 Reporting a danger

How to alert the crew and raise an alarm

Ship's safety is everybody's concern. If you observe a leakage, smell a fire or notice any other danger, it is your responsibility to react deliberately and contribute to the vessels safety. Report the incident and take countermeasures if safely able to do so. Raising the alarm will be done by the ship's command, you can alert them by:



Activate the **manual call point** in case of fire



Inform the **Bridge (100)** in any case and if in doubt



Shout, inform persons and crew around you and try to mark-off and close the unsafe area

Fire on board - Initial measures

Fire is a vessel's largest threat. In case you spot a fire or an ignition source, report it right away.

As long as there is no danger for yourself and after reporting, you may fight a fire as long as it is very small or small, e.g. a burning garbage can. For fire-fighting use the portable fire extinguishers, located all over the ship. They are **suitable for fire classes A, B, C (solid, liquid and gaseous)** as well as electrical fires if a minimum distance of 1 mtr is maintained. If a person is on fire, use of fire blankets or if unavailable, powder fire extinguishers. Activate a powder fire extinguisher as following:



1. Take the extinguisher off the wall



2. Pull off the safety pin



3. Push the red button and wait for 3 seconds.



4. Attempt extinguishing the fire.

6 Ship's alarms

If a ship's alarm is raised:

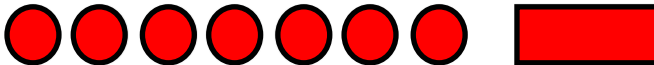
- Stay calm and stick to your role, depending on the type of alarm (see below)
- All persons on board shall proceed immediately to their designated muster station (see below)
- Do not call the bridge and ask for reason
- Take your colleagues with you
- Choose the shortest way to open deck areas

Prepare yourself to fight the threat. All crew might be in the fire-fighting teams or take tasks related to the incident.

Types of alarm

General alarm:

7 x short blasts followed by 1 prolonged blast



Abandon ship alarm:

1 x short blast followed by 1 x prolonged blast, continued



a) General alarm - Actions required



- Proper clothing including:
 - Warm head protection
 - Long-sleeved clothes
 - Gloves
 - Warm stable footwear
- Carry your lifejacket, but don it just at the muster station
- Carry your personal medicine
- Proceed immediately and directly to the muster station



- The Cargo Mate will check the completeness of scientists and the evacuation team
- The Cargo Mate announces the boat numbers of the cruise participants and the scientists are separated into the boat groups
- Four members of the evacuation team will assist and take responsibility for one scientist group each.

- Upon Master's order the scientists are guided to the boats

All further information and decisions will be communicated by radio communication. If situation requires, the group may change their waiting position, e.g. to the conference room. If the Master decides to abandon the ship the alarm for abandoning the ship will be raised (see below)



b) Abandon ship alarm - Actions required

Actions for the crew are assigned in the muster list, but without undue delay everybody shall assist in creating the best possible conditions for survival. This includes in particular:

- **Dress quickly**, completely and as warm as possible (even in warm weather)
- Bring your immersion suit (don it over your regular clothing)
- Bring **additional clothing**, blankets, drinking water and provisions
- If possible, **drink warm beverages** (no alcohol)
- If possible, bring your **personal medicine**
- Personal effects will be left on board
- Proceed to the muster station



Muster station Boat # 3:
C-Deck, S/B side, under the
boat

Muster station Boat # 1:
A-Deck, S/B side, aside of
the boat



Muster station Boat # 2:
A-Deck, Port side, aside of the
boat

Muster station Boat # 4:
A-Deck, Port side, aside
of the boat

If possible, the lifeboats are launched manned.

- Embarking a lifeboat
- Embarkation will be performed on the boat deck. The crew will lower and prepare the boats.
- In case the lifeboats have to be lowered into the water in an unoccupied state and have to be crewed in the water or in case liferafts have to be occupied, ladders should be used. Those are already for use on the boat deck, covered with tarpaulin. The crew will prepare them and assist you.

- Jumping into the water is always dangerous and may only be considered in extreme danger only!
- Persons in the water should stay together and tie themselves to each other as much as possible. Movements should be avoided in order to save strength. Swimming is only carried out to achieve a safe position in the seaway, to attract single floating persons, or to leave areas where fuel or oil covers the water surface immediately. (see also: Survival in water)
- In case the vessel is abandoned onto the ice one of the gangways may be used, preferred port aft. Additionally the ladders of the boat deck can be used or the boats may be lowered occupied.
- As soon as the vessel is abandoned, the procedure for survival on ice should be followed.

c) Person over board - Actions required

The **general alarm** will be raised and amended by an **announcement** which states that a person is missing or presumably went over board.



- Care for appropriate dress, you might be assigned as lookout outside



Head protection

Lifejacket

Warm, long-sleeved clothes

Gloves

Warm footwear

- proceed immediately to the muster station
- Vessel's command will indicate the kind of incident and decide about the measures to be taken



- The Cargo Mate will be on the flight deck and check the completeness.
- It is important to figure out information about the person missing. If you have seen her / him, report it.

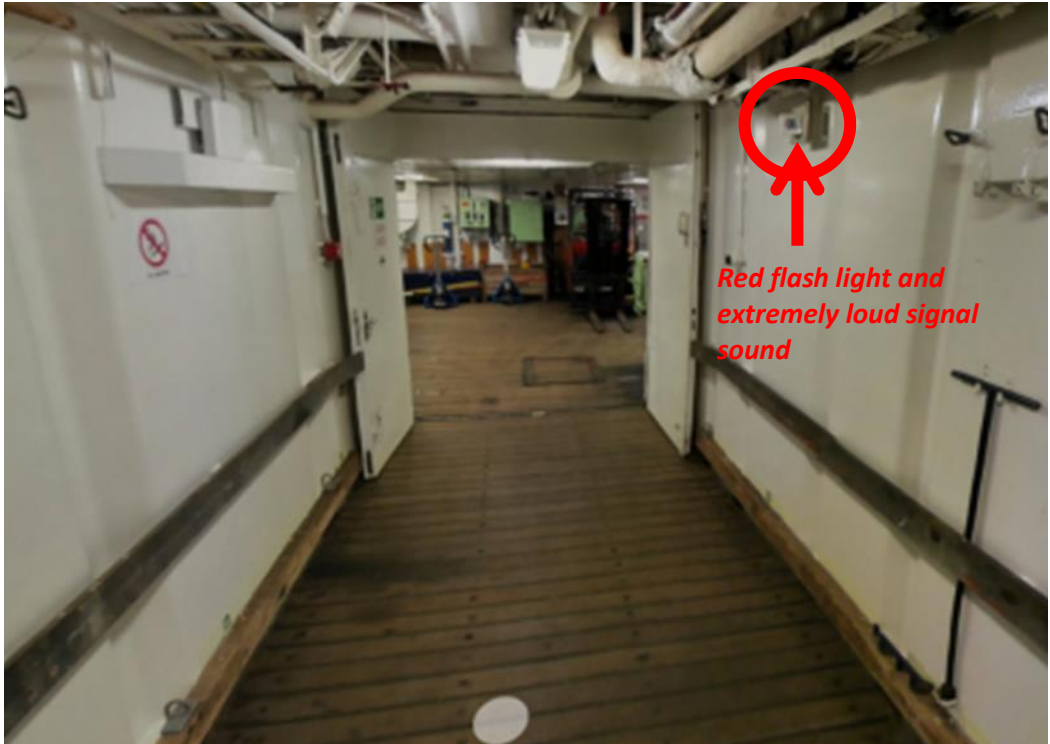
If you observe somebody falling over board:

- **Throw lifebuoy** or any other floating object, life rings are all over the ship

- Shout “Person over board” continuously
- **Keep eye contact** to casualty and show up direction with your arm
- Inform the bridge immediately



d) CO₂ Alarm - Actions required



In case the CO₂ Alarm is raised, you are required to leave the immediately area of:

- Geräteraum
- Upper Hold
- Lower Hold
- Staircase between the holds

The doors shut automatically, take care!

7 Personal survival equipment

Your personal survival equipment consists of:

Your lifejacket

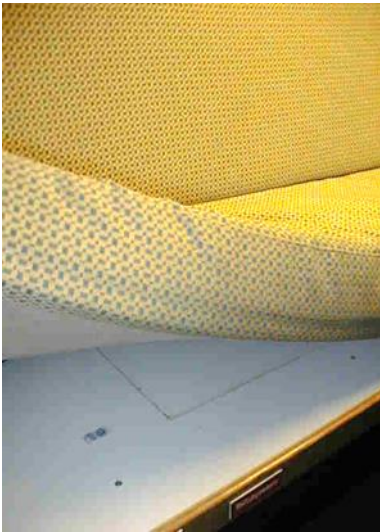


Your lifejacket is in your cabin. Everybody on board has one. Before departure a safety drill is held and you will don this lifejacket in order to familiarize with its operation.

Your lifejacket has:

- Belts for tightening
- A flash light which will be activated in the water
- A line to assemble with others
- A whistle
- And a “how to use” pictogram

Your immersion suit



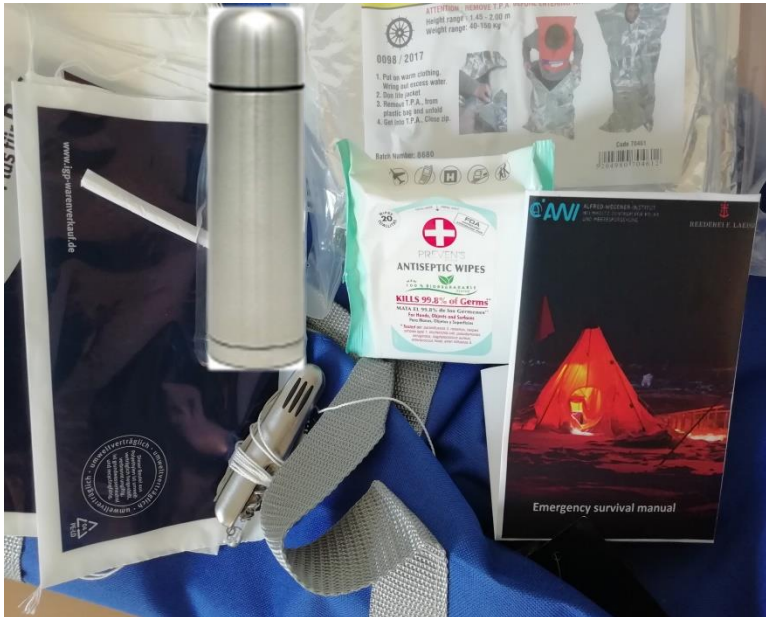
Your immersion suit is stowed in your cabin under the sofa. It is vacuum-sealed and should be opened in emergency only.



Your immersion suit is a dry type-suit. No water will enter, you will stay dry and warm. It is tested to a minimum air temperature of -50°C .

In case of an abandonment, whether in polar regions or in tropical areas, you have to carry it to the muster station. Your immersion suit will float, turn and keep yourself in a save upright position. Nevertheless it is recommended to don your life jacket additionally.

Your personal survival kit (PSK)



The PSK is in a bag and stowed all together in the lifeboats. The PSK consists of:

- 1 Watertight carrying bag, 20 ltr
- 1 emergency penknife
- 1 Aluminum thermos bottle
- 1 set anti-bacterial hand wipes
- 1 set sea-sickness bags
- 1 Thermal protective aid

In the event of abandonment you will receive your bag in your lifeboat after leaving the vessel.

Your polar clothes



As soon as the vessel operates in Polar Regions, everybody on board has a polar clothes duffle bag, containing at least:

- Red polar overall
- Cap
- Boots
- Gloves
- Face mask
- Sun glasses

These clothes belong to your personal survival equipment in case of abandonment.

You are obliged by law to be familiar with your personal survival equipment. If you have any questions do not hesitate to ask. The safety officer is the person in charge but also every crew member is competent to answer questions.

8 Group survival equipment

The group survival equipment (GSK) is listed below. In case of abandonment this equipment is meant to ensure a survival time of seven days. The equipment is handled by the crew.

The GSK, for your good information, consists of:

- 4 x lifeboats
- 10 x liferafts
- Inflatable sleeping mats, 68 pcs.
- Shovels, 2 per boat
- Stove, fuel, matches and pot
- Toilet, mobile
- Emergency food for 7 days (boats)
- Fuel for heating 7 days (boats)
- Power supply 7 days (boats)
- Flashlight, all boats and rafts
- Water containers and purification
- Desalinators in all lifeboats
- Bear guard guns and ammunition
- Sponges
- Axe
- Spares for minor electrical repairs
- Fishing tackle
- 4 x Satellite distress beacons EPIRB
- 14 x VHF with reserve battery
- 14 x SART, for each lifeboat and raft one
- 2 x Iridium phones hand held, (boat 1 and 4)
- 1 x Megaphone (boat 4)
- Parachute rockets, hand flairs, smoke signals
- Engine tools, lines and spares
- Search light

9 Survival in lifeboat, liferaft, water, cold water

Survival in the survival craft

Prior leaving the ship

- Put on as many layers of warm clothing as possible, including your feet. Make sure to cover your head, neck, and hands. The outer layer should be as watertight as possible. Fasten clothing to improve insulation and to minimize cold water flushing in and out beneath the clothing.
- If an immersion suit is available put it on over the warm clothing.
- Put on a suitable lifejacket and secure it correctly. If in cold water you will quickly lose full use of your fingers. If the lifejacket is fitted with crotch and/or other retaining straps, make sure that they are pulled tight. They will hold the lifejacket in the right position, increasing buoyancy – you may not be able to tighten them once in the water.
- If time permits drink a lot before leaving the ship: warm sweet drinks are best – but no alcohol: it can reduce the chances of survival in cold water. Take extra water with you if possible.
- Before leaving the ship, or immediately after boarding the survival craft, take anti-seasickness medicine.
- Avoid entering the water at all if possible. If you must go into the water, avoid jumping in. If davit-launched survival craft, a marine escape system or other means of dry-shod embarkation are not available use over-side ladders if you can, or lower yourself slowly, by means of a rope or fire hose, for example.
- If jumping into the water is unavoidable, you should try to keep your elbows to your side and cover your nose and mouth with one hand while holding the wrist or elbow firmly with the other hand. Just before you jump look down to ensure the area beneath is clear of obstruction, and then

jump with eyes fixed on the horizon to ensure you stay in a vertical position as you fall. Avoid jumping onto a liferaft canopy (you may injure yourself or people inside) and avoid jumping into the water astern of a liferaft still secured to the ship, in case the ship has some remaining headway.

In a survival craft

You should try to enter the survival craft "dry". But this may not be possible, and the craft is unlikely to be dry itself. You can still cool to dangerous levels – especially if wet to begin with, partly because of the evaporation of water in your clothing. Even if wearing an immersion suit, or a so-called "dry" suit, you may still be wet. But stay calm: there are things you can do to improve your situation:

- Enclosed survival craft give you better protection from the elements, but may still become wet inside. Having checked that there are no other survivors able to reach the raft, close the covers as soon as you can, before your hands get too cold.
- Try to avoid sitting in water: sit on your lifejacket if there is nothing else available.
- Squeeze as much water as you can out of sodden clothing before replacing it, to reduce body heat loss through evaporation.
- Huddling close to the other occupants of the survival craft will also conserve body heat – but ensure craft stability is not compromised.
- Follow your survival craft training (water and food rationing, etc.).
- Keep a positive attitude of mind about your survival and rescue: your motivation to stay alive does make a difference! While you wait "Stay warm; stay alive" should be your motto.

Survival in the water

Because of the greater body heat loss in water, you are always better off out of the water than in it – despite how this may feel at first – and you are better off partially out of the water even if you cannot get out of it entirely.

After the initial responses have passed and you have regained control of your breathing, you should:

- Orientate yourself and try to locate the ship, survival craft, other survivors, or other floating objects. If you were unable to prepare yourself before entering the water, button up clothing now. In cold water, you may experience violent and distressing shivering and numbness. These are natural body responses that are not dangerous. You do, however, need to take action as quickly as possible before you lose full use of your hands.
- Do not attempt to swim unless it is possible to reach a fellow survivor or a nearby shore, craft, or other floating object onto which you can hold or climb. Staying calm and still conserves heat.
- If swimming, swim on your back, using only your legs if possible. The arms are critical to heat loss. Not using your arms to swim means that you can keep them folded over your torso to assist in insulation.
- Swim downwind of a floating object if you are trying to reach it, rather than straight towards it. The wind will bring it in your direction. Once upwind of a liferaft, for example, you are unlikely to be able to reach it. Keep checking the object's location and your progress towards it. If you decide that you cannot reach it, stop swimming, stay calm and stay still.
- The body position you assume in the water is very important in conserving heat. Try to float as still as possible, with your legs together, elbows close to your side, and arms folded across your chest. This position – which may only be fully

achievable if you are wearing a lifejacket or dry suit – minimizes the exposure of the body surface to the cold water.

- The floating body tends to turn towards on-coming waves, with the legs acting like a sea anchor. If you have to, paddle gently to maintain a back-to-wave position. Although this may increase heat loss, you need to protect your airway from wave splash.
- Link up with other survivors if you can: it helps location and rescue.
- Keep a positive attitude of mind about your survival and rescue. This will extend your survival time. Your will to live does make a difference!

Cold water survival

If you need to abandon ship you should, if possible, avoid going into cold water at all. Cold water represents a much greater risk than cold air, partly because water takes heat away from the body much more effectively than air. Human beings cool down four to five times faster in water than in air at the same temperature – and the colder the water is the more likely it is that you will suffer the physical reactions and medical problems described below. Therefore, you should try to enter survival or rescue craft directly, without entering the water.

The major threats of cold water immersion are:

- Drowning,
- Hypothermia, and
- Collapse just before, during, or after rescue.

Four stages of immersion have been identified. Each is associated with own particular risks. The understanding of this risks helps to deal with them in a proper way.

Initial responses to immersion in cold water may include:

- -Inability to hold your breath
- -An involuntary gasp, followed by uncontrollable breathing
- Increased stress placed on your heart.

These responses are caused by the sudden drop in skin temperature. It is important to remember that they will last only about three minutes and will then ease. Remember as well that, at this stage:

- the fitter you are, the smaller the initial responses to cold water immersion and the smaller the chance of you experiencing heart problems;
- wearing an appropriate lifejacket, properly fitted, will decrease the risk by helping to keep your airway clear of the water and reducing the need for you to exercise during this critical period;
- wearing appropriate protective clothing will also decrease the risk by slowing the rate of skin cooling and thereby the size of the initial responses;
- if you experience initial responses you should stay still for the first few minutes of immersion, doing as little as possible until you have regained control of your breathing: a lifejacket or other source of buoyancy will help you do this; and
- the period of possible self-rescue starts immediately after the initial responses (if experienced), and before hypothermia sets in.

Short term immersion effects follow the initial responses. During this phase, cooling of the muscles and nerves close to the surface of the skin – particularly in the limbs – can lead to inability to perform physical tasks. Swimming ability will be significantly impaired. (Swimming accelerates the rate of cooling in any event.) It follows that:

- essential survival action that requires grip strength and/or manual dexterity – such as adjusting clothing or your lifejacket, or locating a lifejacket whistle or turning on a light, for example – should be taken as soon as possible after the initial responses to cold water immersion have passed.
- You should not attempt to swim unless it is to reach a fellow survivor or a nearby shore, craft, or other floating object onto which you can hold or climb.

Stay calm. Evaluate your options. Can you reach a shore or floating object – knowing that your swimming ability to swim will be less than normal? If not, stay where you are, conserve body heat (see below), and await rescue.

Long-term immersion effects include a fall in deep body temperature (a cooling of your vital organs such as your heart, lungs and brain) to hypothermic levels. However, the rate at which your deep body temperature falls depends on many factors, including the clothing you are wearing, your physique condition and performed activity like swimming for example. Your temperature will fall more slowly if you:

- wear several layers of clothing, including head covering – especially under a waterproof outer layer such as an immersion suit, and
- keep still – this is greatly facilitated by wearing a lifejacket.

The rescue phase is the fourth stage of immersion you should focus on. A significant percentage of people die just before they are rescued; during their rescue; or just after it. This may be because of:

- the way in which they are rescued,
- relaxing too soon, or
- loss of buoyancy – actions such as waving, etc. may release air trapped in clothing. Again, wearing a lifejacket removes this threat.

-

It follows that:

- you should stay still in the water: blow a whistle or shout to attract attention – but do not wave unless you are wearing a lifejacket or have some other aid to flotation;
- the rescue itself should be carried out appropriately (see the rescue phase, below); and
- you should maintain your determination to survive throughout. Do not relax too soon.

Summing up

Let's sum up with some important reminders about survival. Follow them, your life may one day depend on them.

- Plan your emergency moves in advance. Ask yourself what you would do if an emergency arose. Where is your nearest exit to the deck for escape? Where is the nearest available immersion suit, lifejacket, SART, emergency location beacon and survival craft? How would you quickly get to your foul weather gear, insulated clothing, gloves, etc.?
- Know how your survival equipment works. The time of the emergency is not the time to learn.
- Even in the tropics, before abandoning ship put on many layers of clothing to offset the effects of cold. Wear an immersion suit if available.
- Put on a lifejacket as soon as possible in an emergency situation – and adjust it correctly.
- When abandoning ship, try to board the survival craft dry without entering the water.
- Take anti-seasickness medicine as soon as possible.
- If immersion in water is necessary, try to enter the water gradually.
- The initial response to immersion in cold water will only last a few minutes: rest until you regain control of your

breathing. (This initial response will not always occur, but is more likely with lower water temperatures/less protection.)

- Try to get as much of your body as you can out of the water.
- Swimming increases body heat loss. Only swim to a safe refuge nearby if the likelihood of early rescue is low and you are confident that you can reach it. Swim on your back, using only your legs if you can.
- If trying to reach a floating object swim downwind of it, letting the wind bring the object to you.
- If not swimming to a refuge, try to reduce your body heat loss: float in the water with your legs together, elbows to your side, and arms across your chest.
- If you are not wearing a lifejacket, do not wave to attract attention. You will lose buoyancy if you have no lifejacket.
- Force yourself to have the will to survive. This can make the difference between life and death. Keep your mind occupied and focus on short-term objectives.
- Do not over-exert yourself during the rescue process: let the rescuers do the work – they are in a better condition than you.
- Even while being rescued, do not relax too soon.

Advanced knowledge, planning, preparation and thought on your part can be the most significant factors in your survival – or in treating others who have been exposed to the cold.

10 Survival on ice and remote shore

Survival after abandonment will depend on several factors, such as the types and combination of equipment, crew training and good leadership of each survival craft. The expected time of rescue is a defining factor for life-saving appliances and arrangements. Conditions that are not otherwise considered critical may become critical over the time. With this in mind, equipment should be used thoroughly and personnel should be cared for and treated as studied in training.

It is assumed by many that the stay in the rescue craft at sea or ashore is a passive ‘waiting game’, in which the survivors wait for the SAR parties to arrive.

We know or will learn, however, that surviving in a rescue craft for a week whether at sea or ashore will require active participation by the survivors. Active participation means to conduct basic tasks like:

- Alerting SAR units
- Coordinating yourself, the camp and the different rescue crafts
- Managing resources
- Keeping lookout
- Keeping watch
- Rationing food/water supplies
- Producing water / supplies
- Conserving body heat (preventing condensation)
- Ensuring blood circulation (moving limbs regularly)
- Relieving oneself (going to the ‘bathroom’)
- Caring for sick/injured personnel
- Actively participating in the evacuation from the rescue craft to the rescue vessel etc.

Specific conditions to be considered for the survival in polar regions:

1. prolonged expected time of rescue;
2. operation in low-air temperatures;
3. operation in ice covered waters;
4. icing of life-saving appliances and arrangements;
4. the effect of operation in high latitudes;
6. operation in extended periods of darkness;
7. areas with dangerous wildlife; and
8. abandonment onto ice or land.

Equipment

The survival equipment on board is divided into personal survival equipment and group survival equipment. The vessel is certified for 124 persons on board, survival equipment is kept for 136 persons.

personal survival equipment

Personal survival equipment is

- Stored in the cabin in personal polar clothing duffle bags. The immersion suit and lifejacket are in the cabin, all ready for immediate use;
- Some pieces of equipment, those not necessary for abandonment, are stowed with the safety equipment in dry bags in the lifeboats.

The polar clothing duffle bags contain for each person at least the following:

- Hat

- Gloves
- Socks
- Skin protection cream
- Sunglasses
- Carrying bag
- Polar overall
- Face mask
- Boots

Plenty of additional equipment is stored on board and managed by the navigation officer and Cargo Mate.

All persons on board are equipped with the following, stored in the cabins:

- A Viking 5002 immersion suit
- A lifejacket with whistle and light

Additional suits are stored in the hangar and in the safety stores.

Personal survival equipment stowed in dry bags in the lifeboats:

- Penknife
- Thermos bottle
- Thermal protective aid
- Polar survival guidance
- Anti-bacterial hand wipes (set of)
- Sea sickness bag

Group survival equipment

Group survival equipment is stowed in the lifeboats. The group survival equipment consists of

- Shelter, consisting of lifeboats and liferafts
- Inflatable sleeping mats, Thermarest, Traillite, large
- Thermal protective aids
- Shovels, 2 pcs per boat
- Sanitation, included in lifeboats
- Stove and fuel, one per boat with fuel for 75 days
- Emergency food, (12000 kJ each) which includes lifeboat and liferaft food for seven days / 136 persons
- Flashlights, one per shelter
- Water and windproof matches in lifeboats
- Whistle, included in personal survival equipment
- Water containers and purification equipment, which is in each lifeboat
- Spare set of PSE (polar duffle bag and suit)
- All equipment stowed in waterproof container or boat
- Bear guard guns and ammunition for the Arctic, four pcs.
- Sponges (1 per boat)
- Wooden mallets (1 per boat)
- Spares for minor electrical repairs

Communication equipment

- Satellite distress beacons (each boat)
- VHF
- Iridium phones hand held
- Search and rescue transponders (SART),
- Megaphone

position fixing equipment

- GPS, handheld

Using equipment

Setting up a camp

Campsites – things to consider

- The relationship of the site to the hills, cols etc. Could you relocate to a less exposed/less turbulent area?
- Is the site likely to suffer from high accumulation (in the lee of hills)?
- Are there risks of avalanches, serac falls, rock falls, or from crevasses?
- Tides and wave action on beach sites
- Wildlife hazard and impact
- What do the sastrugi tell you about the predominant wind direction? Where will drifts form?

Basic actions when setting up camp

- Plan ahead if possible to select a safe site
- Think about where the strongest wind will come from and determine that as bow direction
- One crew member is held responsible for putting up and maintaining a liferaft or lifeboat, each boat is shelter for 18 persons, each raft is shelter for 7. In case of an incident, persons shall retreat from rafts to lifeboats. All persons should remember their original boat number and should be housed with their liferaft in vicinity of their boat.
- In case of adverse conditions, the boats should be used as sole housing for all personnel.
- Use the boats to provide shelter to the liferafts by surrounding them (lookout posts)

- On arrival, decide on a clean area (upwind) for snow blocks and a dirty area (downwind) for the toilet. Put in a pee sign at this stage.

 **Pee**



 **Water making**

Communication equipment

Boats 1 and 4 (the command boat) are equipped with Iridium Phones, VHF-UHF, EPIRB and SART. Boats 1 and 2 are equipped with EPIRB, VHF, UHF, and SART. All rafts are equipped with VHF and SART.

For satellite distress beacons, although multiple beacon transmissions can be detected successfully by the satellite system, it is not recommended to activate multiple beacons, unless the survival craft operating the beacons are widely dispersed, as this can cause interference on direction-finding equipment. Using emergency position indicating beacons in series, rather than in parallel, will

1. preserve battery life;
2. enable extended periods of time for the transmission of alerting or locating signals; and
3. avoid potential interference.

The sequence of activation will be determined by the master, depending on the availability and need. If it is necessary to split the group, the action will be directed by the coxswain.

Food and water

Food is calculated to provide 12000 kJ per person and day for seven days and for 136 persons. Water is calculated to provide two litres per day. Food should be stowed in the lifeboats as safest place and distributed to the liferafts which belong to the lifeboats. Drinking water is produced via snow melting in icy condition or membrane pump if there is no ice. Water should be treated with the chloride provided in the lifeboats.

Energy

The energy reserve is calculated to run the boat and its heating for the maximum expected time until rescue. Fuel for melting snow is calculated for the same period. Batteries are sufficient for this time and chargers for communication equipment can be supported by 12 V and 24 V from the lifeboats.

Weapons

All weapons and ammunition shall be distributed to the lifeboats in order to prevent wildlife attacks from the camp. Coxswains or their deputies should be familiar with weapon handling. Persons doing the safety rounds in the outer area shall be armed as appropriate to the area and the scene of the incident.

Medical equipment

Following equipment shall be packed:

Emergency Backpack (1) Breathing	Hospital
Emergency Backpack (2) Circulation	Hospital
AED	Bridge
Ready to heat blanket	Hospital

Furthermore

PSE and group survival equipment shall be sorted and distributed to the boats and rafts. In this way, in case of separation or loss of units, not all of the equipment will be lost.

In order to see and counter dangers at an early stage, a watch system with safety rounds should be established.

All persons should know about the necessary tasks for the survival of the group and contribute according to their abilities. Staying active is also necessary in order to combat fatigue. Fatigue occurs during the development of hypothermia, it is characterized by increasing passivity, social isolation, mood disturbances and a feeling of general discomfort, including feeling constantly cold.

The camp location and, in case of drift, its direction and speed should be monitored and communicated to the rescue facilities.

Everybody should read the survival guide and undergo training for the occurrences it describes.

Possible malfunction of LSA and its consequences

- During evacuation, a boat or raft and its equipment might get lost. As the survival equipment is distributed over fourteen shelters, this loss should be compensated for.
- Rafts may be buried to withstand a severe storm.
- If cracks occur in ice, personnel must retreat to the lifeboats.
- If pressure develops in ice, personnel must retreat to the lifeboats.
- If animals attack, personnel must retreat to the lifeboats.
- Minor damage can be repaired with the tool kit and spare parts.
- Upwelling fuel from the abandoned wreck could contaminate ice taken for fresh water.

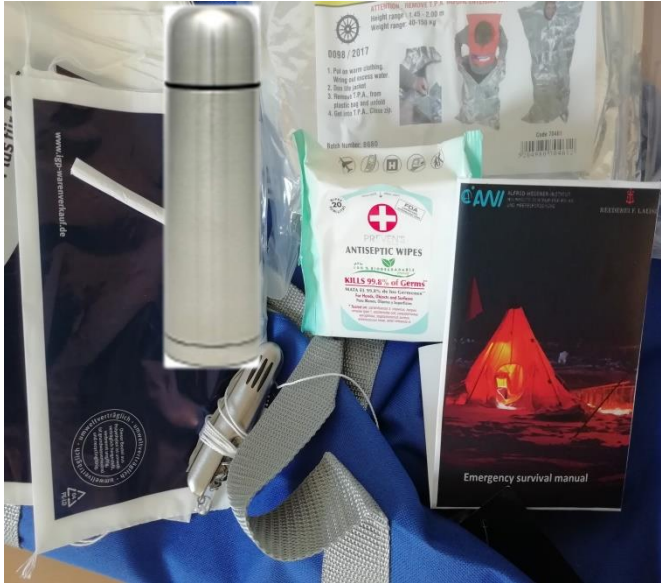
Familiarization

All scientists are instructed in the use of personal survival equipment and actions to take in an emergency. This instruction is given prior to the vessel's departure. It is delivered by the safety officer and it covers

- General rules for ship's safety
- Kinds of alarms and behaviour in case of alarm including muster list and station
- Life jackets and immersion suits
- Lifeboats and liferafts
- Use of PSE

The crew is trained in the use of the PSE and GSE. All crew are trained in crowd and crisis scenarios. Ship's command and those crew, who will or might command a lifeboat are trained especially for survival on the ice.

Personal survival equipment



The PSK consists of:

Penknife or tool with knife

Thermos cup or bottle

Thermal protection aid

Survival guidance

Anti-bacterial wipes

Sea sickness bag

The equipment is stowed in waterproof bags in the life boats.

The survival suit is -50°C approved



SOLAS approved multi-layer immersion suit with double thermal insulation for optimal protection in the harshest of marine conditions. The VIKING YouSafe™ Blizzard has fully integrated buoyancy ensuring superior freeboard while eliminating the need for a separate lifejacket.

The features are

- Extra thermal insulating liner
- Detachable gloves for easy donning and access to emergency rations and pyrotechnics
- Integrated buoyancy

Clothing



The minimum clothing for all persons on board is:

- Red polar overall
- Cap
- Boots
- Gloves
- Face mask
- Sun glasses
- Survival suit
- personal survival kit (PSK)

This clothing is used for normal operations as well as in emergency. Everybody should have his personal clothing in good order and in the cabin for immediate use.

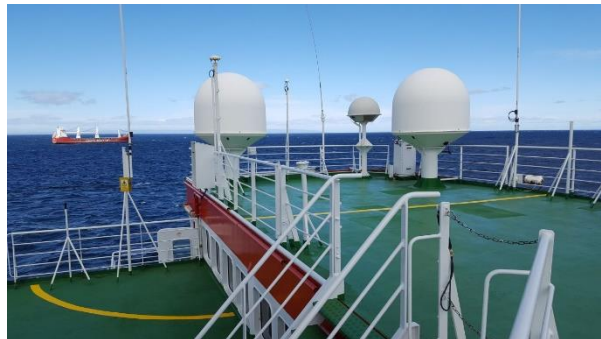
Group survival equipment consists of

- Shelter, consisting of life boats and life rafts
- Inflatable sleeping mats
- Thermal protective aids
- Shovels, 2 pcs per boat
- Sanitation, included in lifeboats
- Stove and fuel, two per boat with fuel for 7 days
- Emergency food (12000 kJ each) which includes life boat and life raft food
- Flashlights
- Water and windproof matches
- Whistle, included in personal survival equipment
- Water containers and purification equipment, which is in each lifeboat
- Spare set of Personal safety equipment (PSE) (polar duffle bag and suit)
- All equipment stowed in waterproof container or boat
- Bear guard guns and ammunition for the Arctic, four pcs.
- Sponges (1 per boat)
- Wooden mallets (1 per boat)
- Spares for minor electrical repairs
- Snow saw
- bivouac bag
- sleeping bags
- Ice screw

11 Occupational safety on board

Areas of enhanced radiation exposure

There are areas of enhanced radiation on the bridge deck. Avoid crossing the yellow lines.



Specific safety instructions will be given depending on the voyage's scientific tasks. These are:

- Safety on ice
- Advice for a Neumayer III visit
- Wildlife threats (Arctic region)
- Entering machinery spaces
- Flight safety
- Working with radioactive materials etc.

In general:

As soon as you enter a working area like the working deck you are obliged to:

- Wear safety helmet
- Wear safe footwear
- Wear working safety vests or polar-approved solid lifejackets when side doors are open
- Keep clear of swinging loads
- Follow the instructions given by ship's personnel
- Stay away from ropes and wires
- Stay away from high voltage and gears which are plugged to high voltage.



Fire doors or water-tight bulkhead doors

Fire doors will close automatically in case of fire

- Don't block doors and bulkheads with objects
- Don't pass closing doors / bulkheads
- All watertight compartments have emergency exits



If you require any further instruction or if you feel like further information could support you, please contact the safety officer.

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