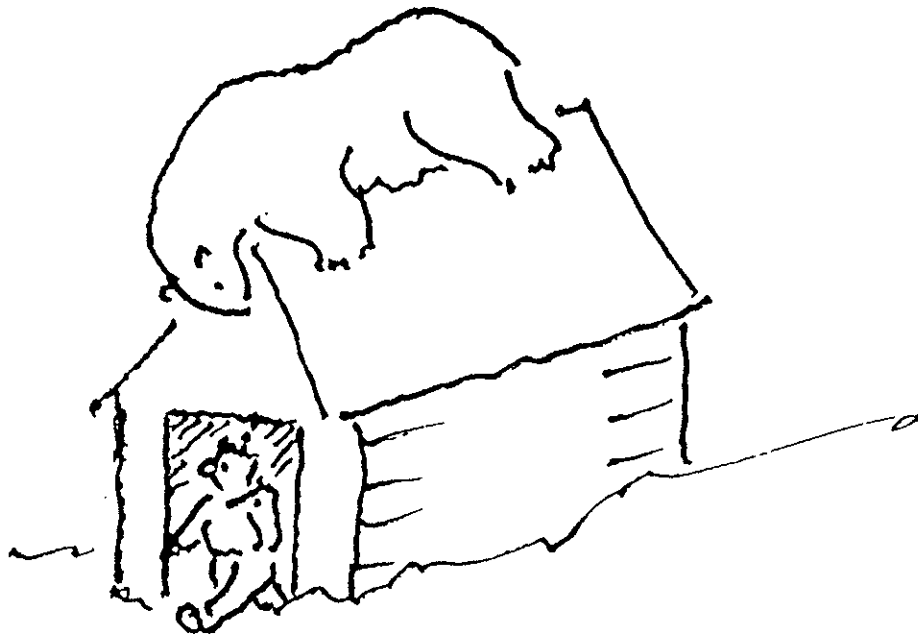


NY-ÅLESUND

SAFETY GUIDE

Second edition
1998



NySMAC *Ny-Ålesund Science Managers Committee*

Written by Nick Cox
Drawings by Michael Cox

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Any comments to this guide should be addressed to:

The NySMAC Secretariat
c/o Norwegian Polar Institute Svalbard
P.O. Box 505, 9170 Longyearbyen, Norway
Phone: +47 79 02 26 00, fax: +47 79 02 26 23
E-mail: nysmac@lby.npolar.no

Additional copies are available from:

Norwegian Polar Institute's Research Station
9173 Ny-Ålesund
Norway
Phone: +47 79 02 71 15
Fax: +47 79 02 70 02

Kings Bay AS
9173 Ny-Ålesund
Norway
Phone: +47 79 02 71 11
Fax: +47 79 02 71 13

NY-ÅLESUND SAFETY GUIDE

Svalbard

The Svalbard archipelago is located between 74° and 81° north and 10° and 35° east. It has a total land area of 63,000 km², two thirds with permanent ice cover. Ny-Ålesund (79° north 12° east) is situated on the mountainous west coast of Spitsbergen, the largest island in the group.

Svalbard, which is part of the Kingdom of Norway, has an international treaty agreement. Sysselmannen (the Governor) maintains law and order. Norsk Polarinstitutt oversees scientific activity. Local scientific projects are co-ordinated by the Ny-Ålesund Science Management Committee (NySMAC).

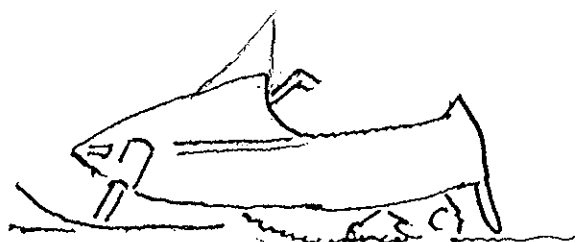
INTRODUCTION

Visitors to polar regions are often unaware of potential danger. Warm buildings, good food and clothing, rapid and reliable transport and communication, plus rescue services at constant stand-by can promote a false sense of security outdoors where the climate and terrain are unpredictable, often harsh and ruthlessly unforgiving.

This guide provides an introduction to safety in Ny-Ålesund and the surrounding area. It includes the main elements of safety and some rules which you must observe. Detailed information about safety techniques can be found in specialised books and manuals.

This guide draws on the experience of others. Please read it and couple it with your own experience and common sense.

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1. NY-ÅLESUND, BRØGGERHALVØYA AND KONGSFJORDEN

The Ny-Ålesund International Arctic Research and Monitoring Facility is the most northerly community in the world. The settlement is owned by the Kings Bay AS (KB) who provide a service infrastructure. KB ceased mining operations in 1962. From 1967 to 1974 a telemetry station recorded data for the European Space Research Organisation. The Norsk Polarinstitutt established research facilities in 1968. In 1991 Britain, Germany and Japan were the first visiting nations to build stations. In order to draw new European polar research activities to Ny-Ålesund, a European Large-Scale Facility funded by EU has been established (Ny-Ålesund LSF) to give access to scientists wishing to do environmental research in the Ny-Ålesund area.

Ny-Ålesund is situated on the southern shore of Kongsfjorden, one of the many deep and wide fjords on Spitsbergen's west coast. Its geographic position, varied topography and prolific representation of bird, animal and plant life, make it ideal for research. The ice-capped interior is dotted with the pointed nunataks which gave the island its name. The steep mountains along the coastal fringe are interspersed with glaciers, some of which terminate in the sea. The coastline (45 km round Brøggerhalvøya) has a strandflat (snow free mid-June to September) with tundra, alluvial plane and braided streams. Kongsfjorden is approximately 28 kilometres long. The minimum distance to the north shore is 4 kilometres.



2. NATURE CONSERVATION

Svalbard has a delicate ecosystem sensitive to human impact. Environmental disturbance must be minimised. It is important you are familiar with Svalbard's conservation laws (information available at Sysselmannens office and the Norsk Polarinstitutt). Ny-Ålesund has designated conservation and research areas with restricted access. They include bird sanctuaries, plant research areas, and sites of special scientific interest. Part of the north-west national park lies on the north shore of Kongsfjorden.

- Vegetation must not be damaged or removed.
- Animals and birds are protected.
- It is prohibited to visit bird nesting areas during the period 15 May to 15 August.
- Snow free areas must be negotiated on foot. Vehicles and bicycles can be used on prepared roads only.

3. CLIMATE

A northern branch of the Gulf Stream produces a climate on Spitsbergen's west coast which is unusually "warm" for its extreme northerly position. The west is mostly free of sea ice during the summer months. The north and east have colder temperatures and are choked with fast or pack ice during most of the year.

Ny-Ålesund	78° 55'N 11° 56'E
Period of midnight sun	21 April - 21 August
Period of polar night	28 October - 14 February
Mean July temp.	+ 5.0°C
Mean February temp.	-14.0°C
Annual precipitation	371 mm

During the high summer the air temperature is normally a few degrees above zero but can fall below. Winter temperatures can fall to -40°C. Gales force winds are frequent and recorded throughout the year. The mixing of warm air from the south and cold from the north creates thick low lying fog which is common during summer months.

4. CLOTHING AND EQUIPMENT

Listed below are some rules concerning clothing and equipment.

The following items **must** be carried in your rucksack when going into the field :



- Map
- Compass
- Pencil and paper
- Whistle
- Penknife
- Medical first-aid pack
- Spare clothing pack (min. hat, mitts, socks)
- Emergency food pack
- Sunglasses and/or goggles
- Bivi bag
- Full outer shell clothing (If not already being worn)



Compass

There are often days when visibility is impaired due to fog, white-out and other adverse weather conditions. Sighting compasses provide the ability to fix your position as well as walk on a bearing. Practice using your compass in good weather conditions.

Map

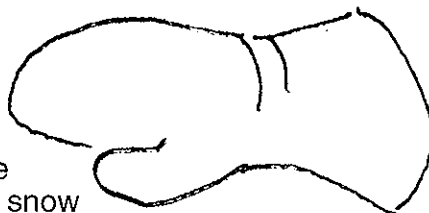
Maps can be purchased in Longyearbyen and Ny-Ålesund. The Ny-Ålesund area is covered by the Kongsfjorden map, number A7, 1:100 000 78° 40'N to 79° 00'N, 10° 00'E to 12° 31'E. NB. The size and shape of glaciers change. Maps may not show their position accurately.

First-aid pack (minimum)	Elastoplast (Elastic adhesive tape) Wound dressing Safety pins Aspirin
Water bottle	Eating snow and drinking from melt streams are best avoided. Glacier streams are often full of fine silt.
Vacuum flask	Hot drink sachets can be obtained in Ny-Ålesund. A half litre flask is usually adequate. Metal flasks are most robust.
Ice axe	It is important to learn how to use an ice axe. Carried on a rucksack an ice axe should have head and tip protectors (the tip often points at the back of the head).
Crampons	Crampons should be fitted to your boots correctly and strapped securely. Always carry an ice axe in your hands when wearing crampons on a slope: they can cause you to trip and fall.
Rifle	See section 14
Flare pens and flare pistols (optional)	See section 14, page 19.

Climbing and glacier travel equipment is not covered in this guide.

Summer clothing

Summer weather conditions on the west coast of Spitsbergen are similar to a mid-European winter. The conditions vary; with periods of wind, snow and rain as well as periods which are bright, calm and warm.



- Lightweight knee length rubber boots are relatively comfortable and keep feet dry when crossing boggy tundra and snow.
- Walking boots are essential for those who plan to walk on ice or steep terrain.
- Always carry spare hat, socks and mitts (warmer than finger gloves).

Winter clothing

Take advice from those who have experienced winter in Svalbard. Weather conditions can vary from year to year. The weather can be intensely cold but mild weather can occur and should be anticipated.

- Outdoor clothing and footwear are often manufactured for the sport/fashion market. Make sure the garments you take to Svalbard are practical and robust.
- Choose clothing that is comfortable and does not restrict movement.

- Numerous layers of clothes are often warmer than a few layers which are heavily insulated. Layers of clothes also provide flexibility in changing weather conditions.
- Choose items that dry easily. It may be important that they dry overnight, ensuring warmth and comfort the following day. Designs with layers that can be separated are preferable. Mitts and boots with separate inner layers are particularly important.
- Consider how your clothing could be repaired if it were necessary. It may be possible to sew or darn natural materials. Take patches and glue, or a roll of spinnaker tape for tears in synthetic materials.
- Heavily insulated clothing can cause overheating. Body perspiration can cause cooling and discomfort later in the day. Wear clothing which can be vented.
- Brush snow off clothing before entering a vehicle or building where snow will melt.
- Hats and gloves are easily lost; take spares of both. A hat is difficult to improvise using other clothing.

5. TRAVEL TO NY-ÅLESUND BY AIR OR SEA

- Have outer shell clothing available when you arrive at Longyearbyen from mainland Norway.
- Be prepared for a delay in Longyearbyen. Weather and ice may hamper the aircraft or ship that will take you to Ny-Ålesund.
- Beware of aircraft propellers, i.e. fixed-wing aircraft propellers and helicopter tail rotors. Ask the pilot for guidance when boarding and alighting.
- If you travel by ship make sure that your luggage is stowed safely in a place where it will not get wet; preferably below deck.
- On board ship, do not go on deck in bad weather. Never go on deck alone. If you fall overboard you may go unnoticed. Survival time in the water can be as little as 5 minutes.

6. SAFETY IN NY-ÅLESUND

It is important to remember that in Ny-Ålesund you are a long way from normal public emergency services, such as hospitals, ambulances, mountain rescue, fire fighting experts, lifeboats etc..

- If you are taking medication, check that you have enough to last the duration of your stay.
- Have your teeth checked by a dentist before leaving home.

- If you wear spectacles or contact lenses take spares.
- Familiarise yourself with Ny-Ålesund fire rules and the action to take in the event of a fire. Instructions are posted on doors and notice boards.
- Beware of fire at all times. Do not leave heaters, cookers or electrical equipment unattended.
- Wear shoes, clogs or slippers in the laboratories.
- Outdoors (particularly near the old mine workings), beware of nails protruding from pieces of wood. They are particularly dangerous when concealed by a thin covering of snow.
- There are many research installations in Ny-Ålesund and surrounding area; do not touch or go near them.
- Do not walk on areas designated for research.
- Vehicles in Ny-Ålesund drive on the right hand side of the road.
- Those who drive vehicles in Ny-Ålesund should drive slowly.
- Stand well clear of aircraft that are landing or taking off.

7. COASTLINE TRAVEL (BY FOOT, SKI OR SNOW SCOOTER)

- Before leaving Ny-Ålesund to go into the field, check the weather conditions and signs of deterioration. If you are going to be on high ground, check for signs of invading low cloud.
- Your rucksack must contain the items listed in section 4.

Communication

Under the following circumstances a vhf radio should be carried.

- a) A person travelling alone.
- b) A group travelling in bad weather or difficult terrain.
- c) Staying away from Ny-Ålesund overnight.
- d) Travelling by boat.

Field records

Before leaving Ny-Ålesund record the following details :

- a) List the names of the members of your party.
- b) The route that you or your party intend to take.
- c) Time of departure and estimated time of return.
- d) Rifle and number of rounds.
- e) VHF radio, and times of any scheduled calls to base. Indicate the radio channel which will be used.
- f) Any other important information.

- You must return to Ny-Ålesund no later than the time noted. Remember to sign in, so others know you have returned.
- Those in Ny-Ålesund should check travel records frequently and alert others if a person or party have not returned by their estimated time.
- Those in Ny-Ålesund must ensure there is someone listening to the base radio set while people are in the field.

Field safety

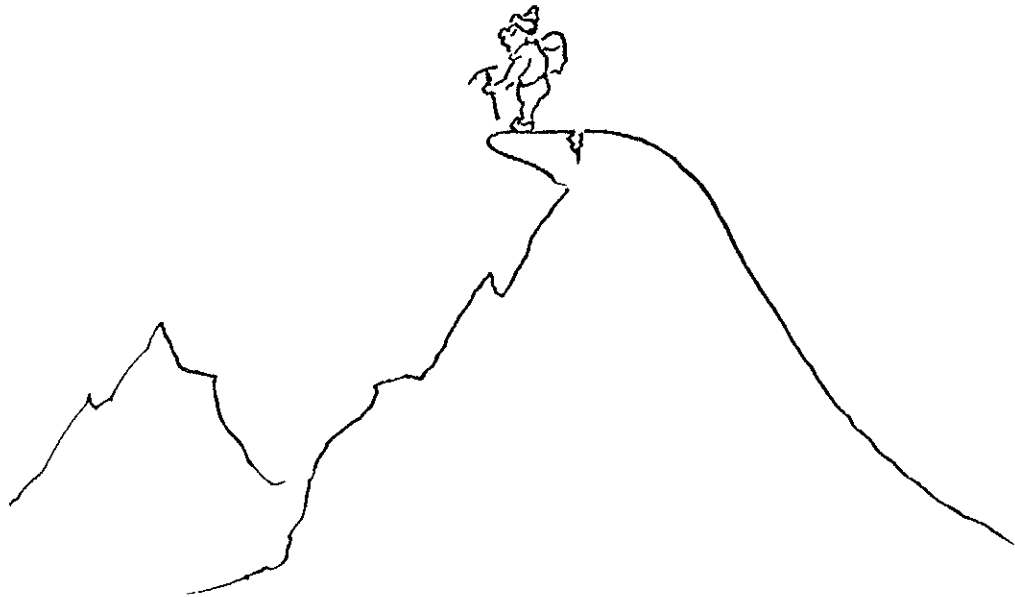
- Beware of snow avalanches, particularly from gullies. Avalanches on the open slopes become increasingly dangerous as the summer season progresses.
- Beware of strong gusts of wind on cliff tops.
- A lot of the rock on Svalbard is frost-shattered and unstable. Beware of falling rocks when standing below cliffs and rocky terrain.



- When working on steep coastlines keep an eye on the tide which could cut off your route back to a gully or way up onto the mainland.
- Avoid frozen lakes. Use your map to look for areas where you might encounter lakes. Avoid unusually flat snow covered terrain.
- Do not walk on shoreline ice foots. An ice foot is the ice and snow which remains on the shoreline when the winter sea ice has broken up and drifted away. The sea erodes and undercuts the ice foot making it weak and unstable. At high tide the overhang is often above deep water. At low tide the overhanging ice wall may be as much as 2 metres high. Climbing from the beach can be difficult or impossible.



- Snow and ice cornices form during the winter months on the lee side of cliffs, steep hill sides and gulleys. Do not walk to the edge unless you are sure it is safe to do so. Rope yourself to a belay point, probe ahead with an ice axe or ski pole.

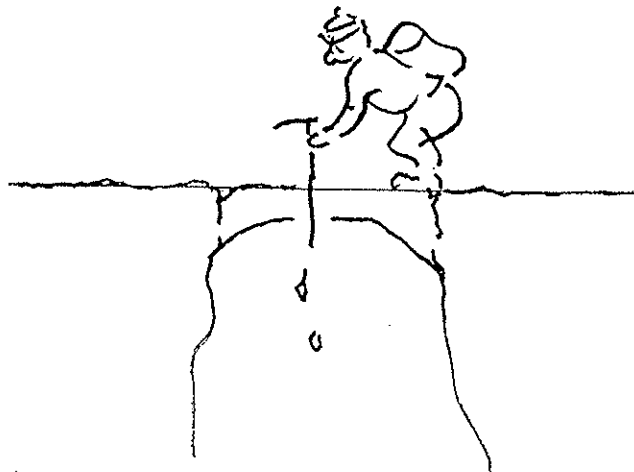


- Beware of snow and ice filled gullies and ravines. They are most dangerous in summer. The meltwater streams erode large tunnels through the ice, and the surface snow melts and softens as the summer season progresses. If you fall through the snow bridge over a ravine you may be washed down the ice tunnel below.
- Always follow the side of a ravine until it runs into low flat terrain (usually near the coast) where the snow is not deep. If possible, cross streams where exposed. Bridges have been constructed over some of the ravines in the Ny-Ålesund area.
- Glacier melt streams are extremely cold and often have strong currents. Crossing them is usually easiest near the coastline where they are wide and shallow or fork into several smaller streams. An alternative is to go inland and look for smaller tributaries which can be crossed in turn.
- The volume of water in a stream can change rapidly. A slight rise in temperature will increase the amount of glacier melt water.

- Precipices and uneven ground can be impossible to detect when travelling in bad weather.
- Fix your position on your map before visibility deteriorates. Bear in mind the accuracy of both compass and GPS.
- If visibility is deteriorating in an area which can be negotiated safely using compass; take a bearing on a known point ahead of you.
- If you are lost in poor visibility, get into your bivi bag and wait for the weather to improve or for a search party to find you.
- Travelling as a group, keep an eye on each other. Walk at the pace of the slowest member of the group, and do not split up unless you have made firm arrangements which make it safe to do so.

8. MOUNTAINS AND GLACIERS

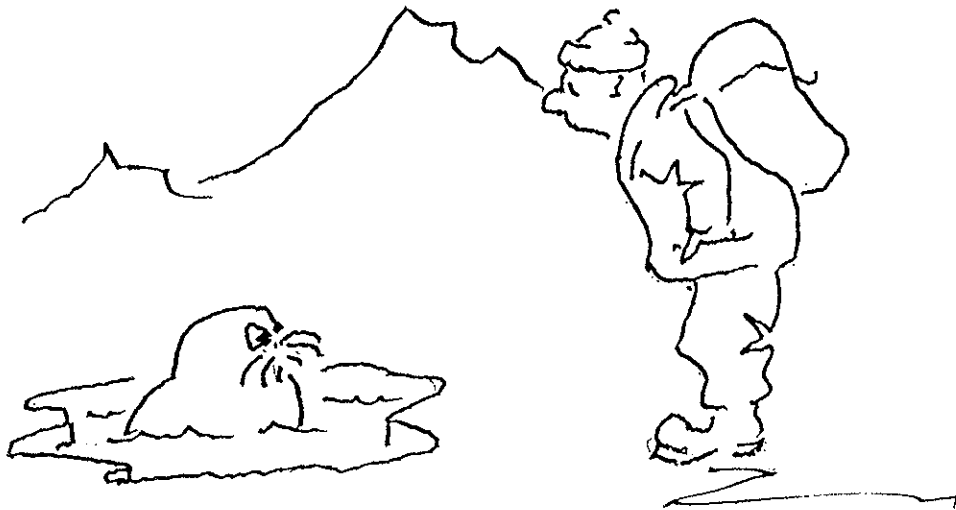
- There is no such thing as a safe glacier. Never go onto a glacier alone. Crevasses can appear in the least likely places and can be concealed from view by snow bridges which cannot support the weight of a human. Ice layers in the bridges can make crevasses difficult to detect by probing.



- Each member of the party must be fully equipped and trained in rope techniques.
- Use caution following a glacier route heard of by word of mouth, or old stake lines that once marked a safe route.
- Bergschrunds can be expected where ice meets land at the sides and head of a glacier.
- Melt water channels which can occur on an ice surface during the summer can be deep with strong currents. The channels sometimes lead to large holes where the water disappears under the ice.
- Moraine can conceal the ice surface and crevasses.

9. SEA ICE

- There is no substitute for experience where sea ice is concerned.
- Fast ice should be weeks old and have endured several gales before you attempt to ski on it. Test the ice with a chisel, pick or ice drill.
- Unlike freshwater ice, sea ice is quite elastic. Dull grey areas may indicate wet rotten ice which is soft and weak.
- Thick sea ice that has been solid for months can break up in minutes. A swell generated by a gale in the distant open sea is the most common cause of destruction.



- The ice is often weak above sunken rocks, between islands and areas where there is a tidal current. Weak areas will also be found near points of land, rocks, and the area surrounding blocks of ice (bergs, growlers, pack) locked in the sea ice.
- Strong winds can shake blocks of ice (bergs, growlers, pack) protruding above the sea ice surface causing the sea ice to break up.
- Do not go near icebergs locked in sea ice. The ice surrounding the berg will have been weakened by the bergs movement and the berg (85% below) may suddenly capsize.
- Open leads in the ice might indicate that the ice is about to break.
- A dark cloud over the ice may be "water sky" above open sea. A bright glare in the sky might indicate ice to the horizon. It is important to remember such indicators are not always reliable.
- In early winter the tidal zone between land and sea will break the ice into blocks. Later in the winter most cracks and holes will be concealed by deep snow.
- The surface pressure of a snow scooter is less than a human on foot. Beware getting off a snow scooter on sea ice.

10. SNOW SCOOTERS

An introduction course is essential for those using a snow scooter for the first time. Snow scooters are fast and fun, but they can take you into a situation you would have avoided given more time for thought.

- Check your snow scooter thoroughly. Check that everything is secure.
- Check the tool roll, spare drive belt and spark plugs.
- Check the fuel tank and oil reservoir.
- Take spare fuel and oil. Frequently check consumption of fuel during the journey.
- Always take a rucksack (see contents list sec.4), skis and a shovel.
- Check that the underside of the snow scooter (the bogeys and the rubber track) is not full of snow and ice. Lift the back end of the snow scooter and support it with a 20 litre fuel can under the tow bracket. The engine can be started and accelerated making the stationary snow scooter clear its own rubber track and bogeys.
- Before starting the engine, check that the throttle cable is not locked with ice. A frozen throttle cable can make a snow scooter, once started, accelerate forward out of control.
- Never start or stop a snow scooter pointing towards a person, tent, vehicle, aircraft or building.
- Before starting the engine attach the emergency cut-out cord to your clothing.



- When travelling in convoy with other snow scooters you must agree on hand signals. Most important is a signal which indicates you are going to stop. Frequently look over your shoulder to check the position of those behind you.
- Travel at a speed which allows you to study the terrain ahead.
- Wind swept snow or low cloud can reduce the contrast making it difficult to see bumps and precipices which can roll a snow scooter or throw you to the ground.
- Cut the motor or walk a distance from your snow scooter before using a compass. The engine can cause compass deviation.
- To follow a compass course on a snow scooter you must first detect the amount of compass deviation caused by the engine. One method is to stop the engine and walk with compass in hand on the bearing you wish to steer. Having walked 50 metres or so, return to your snow scooter and drive (at the speed you will travel) along the footprints you left in the snow while at the same time observing the reading on your compass.

11. BOATING (small craft including inflatables)

Boat handling and seamanship training is essential for those who will be in charge of small craft.

Boat and equipment check list

- Check the soundness of the boat. Check for leaks. Check drainage and any self baling arrangement.
- Oars and rowlocks. Spare rowlock.
- Anchor chain and warp. Check the length of warp.
- Sea anchor.
- Baler and bilge pump.
- Painter and spare rope.
- A chart of the area.
- Compass.
- Radio and battery. Check frequency.
- Medical kit.
- Food, water, cooker, tent etc. for a long wait ashore or afloat.
- Emergency flares.

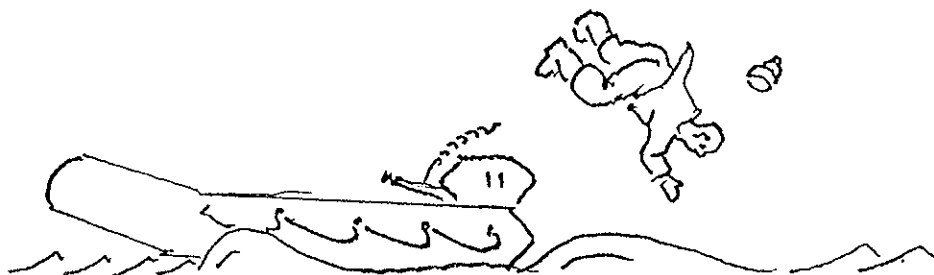
Outboard motor check list

- Motor clamps on the transom.
- Safety lanyard from motor to boat.
- Fuel line, fuel tank and filter. Check fuel tanks are secure.
- Petrol and oil. Fuel funnel.
- Oil mix/type. Does the motor have an oil reservoir i.e. self mixing. Should the oil be mixed in the fuel tank ?
- Gears. Make sure the motor cannot be started in gear. The mechanism which prevents a high throttle setting while the motor is started may be broken. There have been cases of people falling overboard when the boat has suddenly accelerated forward.

- The emergency motor cut-out cord.
- Spare cut-out cord. (Ensure all passengers know where to find it).
- Outboard motor spares.
- Tools.
- Check whether the motor can be started manually with a rope starter cord. Recoil start springs are prone to break in cold temperatures. Carry a spare rope cord.
- The lifting, tilting and locking mechanism.
- The propeller is secure. Does it have a sacrificial shear pin (take spares) or does it have a slip clutch mechanism.
- Spare motor on the transom or in the boat.

Getting under way

- Check weather and sea conditions. Do not make the journey if slight deterioration in the weather would make the journey dangerous.
- Note the state of the tide and whether the wind is onshore or offshore.
- Show passengers on board where equipment is stowed (radio, emergency equipment etc.). Show them how to use the outboard motor.
- Ask passengers to look out for ice in the water ahead. Passengers should not stand up or move about in the boat without the consent of the helmsman (person steering the boat).
- All on board must wear survival suits and carry rucksacks with equipment for use ashore (see sec.4). Before leaving the jetty or shore make sure the survival suits are done up properly. Periodically check the suits do not leak. Pull the hood up and lie back in the water while holding onto the jetty.
- Do not overload the boat.
- Coil or flake the anchor warp and chain so that the anchor can be used the instant it is needed. Check the warp is attached to the boat.
- Make sure that oars or paddles are accessible.
- Radio check with other radio stations.
- Check fuel consumption regularly.
- Check your compass for deviation with motor running and motor stopped.

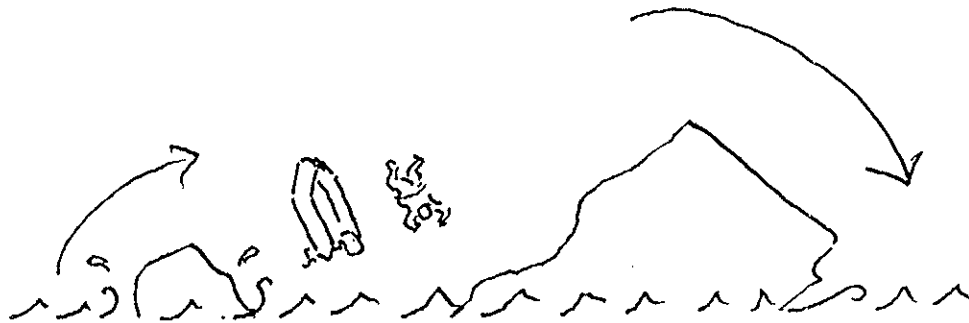


- The helmsman must attach the cut-out cord to a secure point on his or her survival suit. The motor will stop if the helmsman falls overboard. It is important that all passengers on board know where to find the spare cut-out cord so that they can start the motor and go to the assistance of the helmsman.

- Check the motor is not in gear and that the throttle is in the correct setting. Start the motor.
- If the motor will not start a) Prime again, b) If you have pulled the cord several times, leave the motor alone for a few minutes. c) Clean the spark plugs or change the spark plugs.
- Untie the painter and attach it to a fixed point on the boat. Check there are no ropes trailing over the side.
- Before using reverse gear, check that the motor is locked in the down position.

Under way and beach landings

- If the motor stops suddenly while under way
 - a) Anchor or row to anchor depth and anchor.
 - b) Check the fuel line is not squashed by a foot or cargo.
 - c) Fuel
 - d) Dirty fuel.
- Travel at a speed which is kind to boat, outboard motor and passengers.
- Reduce speed in poor visibility.
- In rough seas, fuel cans and cargo can wear holes in the boat hull.
- Reduce speed among brash and pack ice. Lone growlers (large fragments of ice) can go unobserved. Beware of floating logs.
- Vessels approaching one another should pass port to port (left side to left side) i.e. as though on the right hand side of the road.
- Keep clear of ships. Make a wide course away from an approaching ship: your avoiding action should be obvious to those on board.
- Never go near icebergs, they can suddenly capsize. Do not go near glacier snouts where ice can calve.



- Landing on a beach in a rough sea can be difficult or impossible. The beach surf may capsize or swamp the boat and make it impossible to go to sea again.
- Before landing on a beach, stop and release the motor lock and tilting mechanism. Check the wind direction and the beach surf. It is sometimes worth throwing the anchor overboard as you go ashore. The anchor can be used to pull you off shore when you go to sea again.
- Check tides. Lift the boat well above the high tide mark. Always tie the boat to a secure fixed point or dig the anchor into the beach. If necessary stay with the boat while others go ashore.

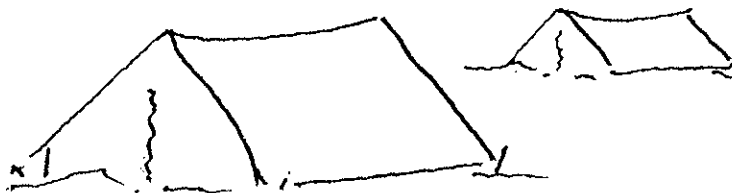
12. HUTS

Most huts in the vicinity of Ny-Ålesund are owned by the KB Welfare club and cannot be used without permission. Do not light stoves unless you have been given permission to do so.

In confined spaces carbon monoxide poisoning is a major hazard in polar regions. Huts and tents must have adequate ventilation. To achieve warmth there is often a temptation to reduce or cut off the flow of cold air from outside. Ventilators are often purposefully sealed when a hut is unoccupied; they can also become blocked by snow. Check that liquid fuel stoves are burning correctly and that wood stove chimneys are clear. Open a window or the door to increase ventilation if you think it necessary.

13. CAMPING

Camp sites have great impact on the natural terrain. If possible use the KB camp site in Ny-Ålesund. Beyond Ny-Ålesund, camp beside a hut where the ground will already be disturbed. A hut can also provide refuge if a polar bear visits the camp.



- If there is no hut in the area you wish to camp, tents should be pitched on the shoreline. The beach (below the high tide mark) can be used for toilet purposes. If possible burn toilet paper.
- Place rubbish in a bag a good distance from the tent door but in line of sight. A visiting bear may inspect the rubbish before visiting the tent. It is also important to conceal food stuffs.
- Collect all rubbish for disposal in the correct way at Ny-Ålesund.
- Place a trip wire with signal flares round the camp site at least 15 metres from the tents. Appoint one person responsible for the flares; removing safety pins at night and replacing them each morning.
- Trip wire signal flares should be handled with caution at arms length. Your head should never be above the flare. Do not look down on a flare while fixing it to a fence pole or adjusting the safety pin.
- A rifle should be ready for use inside one of the tents during periods when the tents are occupied (see section 14). Each tent which is occupied should have some form of protection (rifle or flares).
- Check that the tent is well ventilated particularly if a cooker or lamp is in use.
- Before leaving your tent, write a note stating who you are; the date and time; intended travel route and estimated time of return.

14. FIREARM SAFETY

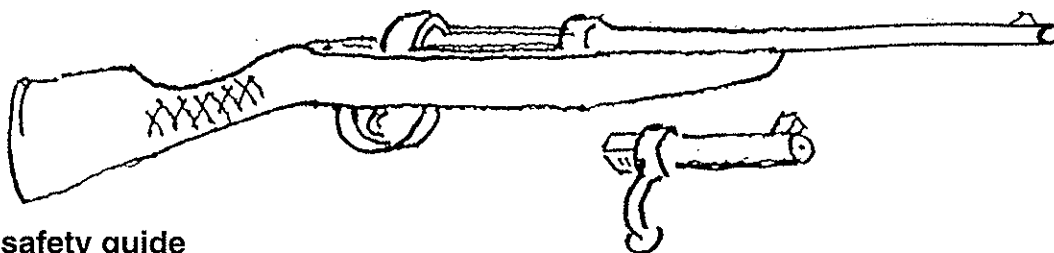
Do not underestimate the dangers associated with firearms. It is important to receive firearm training.

Ny-Ålesund is very crowded during the summer months. There are many individuals and groups who carry weapons for defence against polar bears. Invariably there are some with little training in firearm safety. Measures have to be taken which cater for those with least training or experience.

In the Ny-Ålesund settlement area, rifles, hand guns and flare pistols must be unloaded. A rifle is the most effective and safest weapon.

A rifle can be made safe by removing the rounds (bullets); but this measure alone can leave room for mistakes. A round can be left in the magazine or chamber. Counting rounds in and out of a rifle is not fool proof. Some people have extra rounds loose in their pocket. Rifles passed from one person to another can cause confusion.

The only procedure certain to make a rifle safe and provide clear proof it is safe, is to remove both the rounds and the bolt or retract the bolt (i.e. pull it back).



Rifle safety guide

In the Ny-Ålesund settlement area, rifles, bolts and ammunition must be carried separately

- Attach the bolt and load the rifle magazine in the field (i.e. outside Ny-Ålesund). Remove the bolt and unload the rifle in the field.
- Always handle a rifle as though it is loaded. When not being fired, the rifle barrel should point towards the ground or sky.
- The rifle, the bolt and the rounds should be carried to and from the field in a rifle case.

Rifle protection

- Protect both rifle and rounds from moisture and dirt. Dry and clean rifles returned to the station, hut or tent. In the warm summer period a rifle should be lightly oiled. In cold weather oil thickens and could cause the rifle to malfunction.
- The rifle barrel must not be obstructed. Snow, soil or vegetation in the barrel could cause it to explode if the rifle were fired. The barrel can be protected by covering the end with light adhesive tape or a plastic bag (NB: It is not necessary to remove such protection when firing the rifle).
- In Ny-Ålesund; rifles, bolts and rounds must be stored in a locked cabinet.

Loading

- Check the rifle is not loaded and that it is dry and clean. Open the magazine and look down the barrel.
- Insert the bolt into the rifle.
- Draw the bolt back as far as it will go to expose the top of the magazine. (Sprung metal plate).
- Hold the rifle with your hands and clothing clear of the trigger guard.
- Load rounds in the top of the magazine. Press each round down firmly, stacking them in position. When each round is locked in place, push it backwards with a finger so that the brass case is against the back of the magazine (the rounds are less likely to jam).
- With care, push the rounds down into the magazine while at the same time sliding the bolt forwards over the top of them. The idea is to have the bolt locked in position over the top of the rounds in the magazine.
- Watch the rounds as the bolt is moved forward: make sure that a round is not pushed from the magazine into the chamber (barrel) by the bolt.
- When the bolt has covered the rounds, pull the rifle trigger allowing the bolt to slide fully forward and to lock in position. The bolt is now in position but not "cocked", the magazine is full and the chamber empty. The rifle is loaded and safe.

Unloading a rifle

- Remove the bolt from the rifle. Draw the bolt back as far as it will go and release the catch. The bolt can be removed.
- Open the magazine plate (underside of the rifle) allowing the rounds to fall out. Do not allow the rounds to fall to the ground.
- If the rifle does not have a magazine plate, the rounds must be unloaded using the bolt (this procedure requires great caution). Pull the bolt back and push it firmly forward again, pushing a round into the chamber (the rifle could be fired: keep hands and clothing clear of the trigger). The round will be extracted and thrown from the rifle when you pull the bolt backwards again. Repeat until the magazine is empty. Remove the bolt
 - a) Inspect the inside of the magazine.
 - b) Count the rounds.
 - c) Look down the barrel; check there is no round in the chamber.
 - d) Hand the rifle to another person and ask him or her to check it is unloaded.
- Put the rifle, bolt and rounds separately in a gun case.

Firing a rifle

- Hold the rifle with the barrel pointing towards the ground. Keep hands and clothing clear of the trigger guard.
- Pull the bolt back as far as it will go then push it firmly forward and lock the bolt handle in position. **Put the safety catch in the safe position.**
- The bolt will have pushed a round from the magazine into the chamber (barrel). **The rifle is 'cocked' and ready to fire.**
- Check:
 - a) No person is in line with, or forward of the rifle holder.
 - b) There is nothing in the line of fire which might hide a person from view (building, tent, vehicle etc.)
 - c) There is a safe "stop" (hillside) for the fired round behind the target. A fired round can travel several kilometres.
 - d) Lift the rifle and point it at the target.
 - e) Put the safety catch in the unsafe position
 - f) Aim and fire
- When you have fired a round, hold the rifle with the barrel pointing towards the ground. Pull the bolt firmly backwards: the empty brass cartridge will be ejected. Push the bolt forward to reload. **Put the safety catch in the safe position.**
- A rifle can be fired from a standing position. Lying on the ground or a kneeling position can improve the ability to aim accurately.

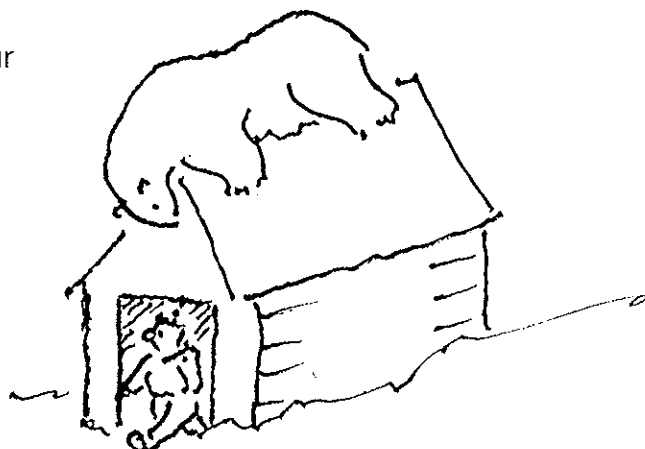
Flare pens and flare pistols

Flare pens and flare pistols should be handled with caution. At no time should they be loaded unless a dangerous situation requires their immediate use.

15. POLAR BEARS

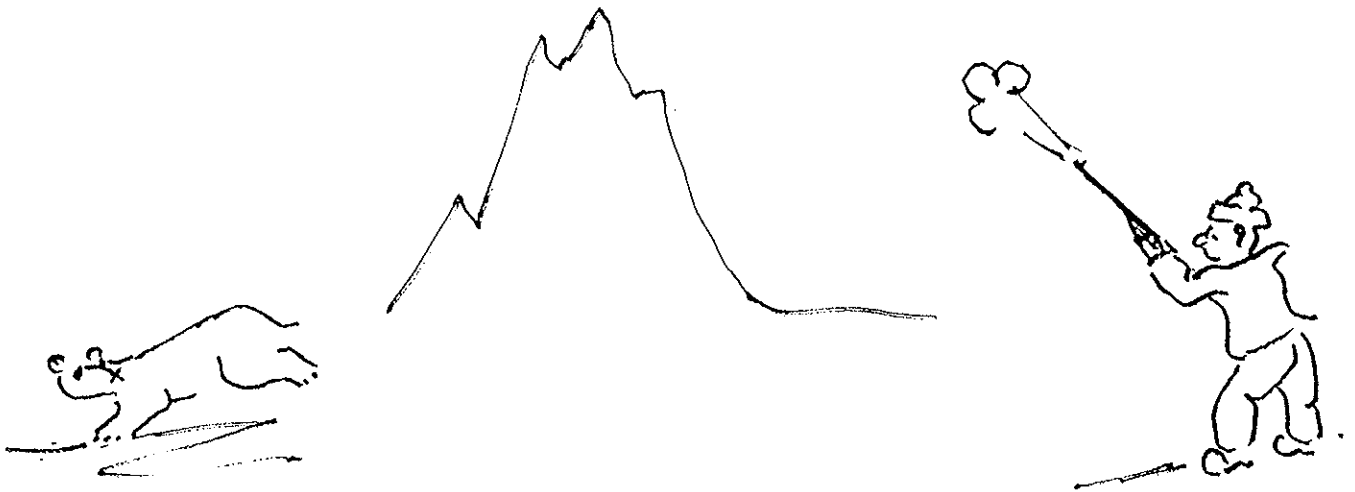
Polar bears can be encountered at any time of year. They are a semi-aquatic animal which might approach from the land or sea. Take all measures to avoid a confrontation. If you want a photograph of a bear please buy one in a shop.

- At all times look for evidence of bears. On high ground scan your surroundings. Look for faeces or tracks in mud or snow.
- In poor visibility or hilly terrain it is important that you make a noise which might warn a bear that you are near. A sudden confrontation may incite a frightened bear to attack.





- If you see a bear, you should try to position yourself downwind of it. If it is safe to do so, you should return to base to alert others. If the bear is aware of you and you are in danger, you should try to reach a field hut.
- If you see a bear, make your rifle ready, but do not take the safety catch off (see section 14). Make sure that you are between your companions and the bear.
- Bears are inquisitive animals, they may approach quite close.
- While retreating from the bear, drop an article of clothing which it may stop to investigate, providing you time to escape.
- If you have a snow scooter; start the engine. The noise may scare the bear away.



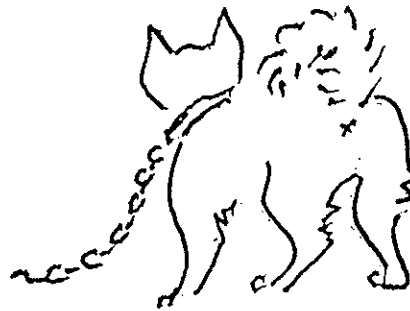
- If the bear is a threat, try to scare it away by firing some warning shots with your rifle. Fire straight upwards.
- Fire several warning shots. Remember how many rounds you have in your rifle. Save at least 3 rounds to fire at the bear should it be necessary.

- If, despite your warning shots, the bear does not retreat and you think it is showing signs of aggression; prepare to shoot it.
- Check there are no humans (or anything which might conceal someone from view) in the line of fire.
- Aim at the bear's chest. If possible aim slightly above and behind the top of a front leg. Having fired the first shot, reload immediately. Aim and fire again if the bear has not already dropped to the ground.
- Remember that bears are usually harmless and they are protected by law. If you kill or injure a bear you will have to account for your actions. You could be fined if the use of your firearm was thought to be unnecessary.
- Dead or injured bears must be reported to Sysselmannen's (the Governor's) office in Longyearbyen.

16. SLEDGE DOGS

There are a number of Greenland dogs in Ny-Ålesund kept for recreation purposes. They are always on a chain or loose in a dog compound.

Greenland dogs are related to the wolf and have behaviour characteristics different to most domesticated dogs. They are a pack animal who instinctively strive to secure a place in the pack hierarchy. Male dog will fight with male dog and female will fight with female until a pecking order has been established. Re-establishing or changing the pecking order can happen at any time.



Never allow a dog to become loose. Secure the lead to a belt round your waist. An unattended dog should be chained (they can chew through a rope). A loose dog can be difficult to recapture. They can cause immense damage in bird breeding areas: they might also go off in search of reindeer. Take special care to check collars and chains before leaving dogs for the night outside cabins or tents.

The most friendly Greenland dogs have been known to attack children.

17. RABIES

Cases of rabies have been reported in Svalbard. Bears, foxes, seal and reindeer can be infected. Unusual behaviour patterns might indicate infection. Avoid touching animals, including those that are dead. Report what you have seen when you return to Ny-Ålesund. Do not kill a creature unless you are certain it is infected and that you are in danger.

APPENDIX 1

CLOTHING GUIDE

Boots

- Mukluks are excellent on snow in dry cold conditions.
- Alaskan snow boots (rubber bottom, leather top) are good in wet snow conditions.
- Insulated leather boots designed to fit a three point ski binding are available.
- Leather or plastic climbing boots should be worn on steep terrain and areas where it might be necessary to wear crampons.
- Leather boots should be coated with a waterproof wax.
- Extra insoles improve the insulation quality of footwear. Insoles can be purchased or made from thin foam mattress material.

Make sure that your boots are comfortable and big enough to take extra socks.

Outer jacket and trousers

- Check the quality of the tapes that reinforce and waterproof the seams.
- Cotton windproof anoraks are good in dry cold conditions. The smock anorak without a zip is the most dependable.
- Salopettes are warm and comfortable, but their shoulder straps hidden below other garments can be a nuisance when going to the toilet outdoors.

Mitts and gloves

- Mitts are much warmer than finger gloves.
Always carry mitts (they should be wind proofed) in your spare clothing pack.

Head gear

- Much body heat can be lost from the top of the head. Spare hats or balaclavas (wind proofed) are important to replace those that are wet or lost.

Sunglasses

- Eye strain and snow blindness can occur on dull overcast days as well as those days when the sunlight is bright. Sunglasses should guard the whole eye and have leather patches to fill the gap at the sides. Have at least two pairs.

Goggles

- Goggles provide protection for eyes in windy conditions; particularly when there is a lot of blowing snow. They are very important when driving snow scooters where the vehicles speed increases the wind chill factor. If visibility becomes impaired due to goggles fogging with frozen vapour they can be exchanged with a dry pair tied inside the warm engine casing.

Gaiters

- Gaiters cover the gap between boot and ankle. Trouser legs are held in and prevent them from being snagged by crampon spikes.

Insulated suits

- Quilt down suits made especially for travelling on snow scooters are very warm, but some are made from material not robust enough for activities which cause excessive wear. Snow scooter suits and insulated cover-all suits can be purchased in Longyearbyen and Ny-Ålesund.

Coveralls

- Valuable cold weather clothing should be protected when involved in activities such as cargo handling or preparing fuel.

NEVER STICK YOUR HEAD IN A POLAR BEAR'S MOUTH!

