University Centre in Svalbard

SAFETY INSTRUCTIONS FOR FIELDWORK AND EXCURSIONS
&
INSTRUCTIONS FOR USE OF FIELD EQUIPMENT

Table of Contents: **Page**

1. OBJECTIVE AND APPLICATION AREA

1.1 Objective

The activities relating to the University Centre in Svalbard (UNIS) are centred around Svalbard's geographical location in the high arctic. This results in fieldwork and excursion into areas where weather conditions, long distances, and limited emergency help require participants to pay closer attention to safety than is customary on the mainland.

The goal of these instructions is to heighten the safety awareness of people involved in fieldwork and excursions arranged by UNIS through careful preparations and implementation of these activities.

1.2 Application Area

These guidelines apply to fieldwork and excursions on Svalbard, in the fjords, and the surrounding waters and islands when the activities are part of ordinary courses and research at UNIS, or are part of other projects or assignments commissioned or managed by UNIS.

These guidelines apply all day during the course of the fieldwork/excursions.

1.3 Definitions

Directions that must be followed appear in boxed text throughout this document. Other text is intended as recommendations or guidelines.

Field work and excursions are the collection and/or analysis of data and material outside the classroom used for research or instruction, or in preparation for such activities. These activities may include the following:

- Established course work in the form of fieldwork (organised class instruction outside the classroom where groups of students, under various degrees of supervision, carry out preset work tasks relating to a specific area within a certain time-frame) or excursions (organised class instruction outside the classroom limited both by time and place).
- Research projects or bachelor/master/PhD work
- Commissioned projects (projects ordered and financed by outside Clients)
- Surveys and inspections (commissioned observations and data collections outside the classroom which are not directly connected to own research or studies (limited by time and place))

Officials Responsible for Safety Issues at UNIS:

Director

|

Person in Charge of Safety Issues

|

Field/Excursion Supervisor

All fieldwork and excursions shall have a field/excursion supervisor. The supervisor has the ultimate responsibility to make sure that the fieldwork/excursion follows the instructions outlined in this document. The supervisor will be the person responsible for the course when he or she is part of the fieldwork /excursion. When this is not the case, the person responsible for the course will delegate this responsibility to other people participating in the fieldwork/excursions. The field/excursion supervisor for master students will be the academic advisor or a person delegated by this person. Special rules and instructions apply to diving activities.

2 RESPONSIBILITIES

2.1 Employers' Responsibilities

UNIS' responsibility as an employer towards its employees is mainly governed by the Norwegian Work Environment Regulations § 14 (Arbeidsmiljølovens § 14).

The employer is responsible for the work environment and safety of its employees. This means that the work shall be of such a nature that it may be completed in a secure and proper way, and that necessary steps must be taken to ensure these conditions. The employer is also responsible to inform its employees of potential accident situations and hazards that may be present in the workplace, and to give its employees the necessary instructions and practice necessary.

UNIS' responsibility towards its employees does not apply towards the students. UNIS may, however, be liable for damages to students suffering from loss or damages if the loss/damage is a result of negligence on the part of UNIS.

UNIS is not responsible for:

- employees and students from other institutions participating in programs administered by these institutions
- employees and students at UNIS engaged by other institutions or organisations in their own fieldwork or excursions
- accidents or deaths resulting from leisure, sports, or other activities which are not a part of ordinary fieldwork and excursions.

All participants in fieldwork and excursion that UNIS are responsible for shall be insured. Students registered with one of the Universities on mainland Norway, are automatically covered through the Norwegian National Insurance Programs.

UNIS offers safety instructions primarily to make sure that safety principles are incorporated in fieldwork and excursions conducted at UNIS. It is also assumed, however, that faculty, staff, and students familiar with these safety instructions also utilise this knowledge in other outdoor activities.

2.2 Employees' Responsibilities

The employees are responsible, among other things, to make sure that the fieldwork/excursion preparations and implementations follow instructions and guidelines given, and to the best of their ability exercise proper judgement and implement decisions to prevent injuries or accidents. The employees are also required to participate in the safety instructions and training mandated by the employer unless the employees can document equal or better knowledge in these areas.

2.3 Students' Responsibilities

Students are required to familiarise themselves with these safety instructions entitled "Safety Instructions for Field Work and Excursions and Instructions for Use of Field Equipment". The students are also required to follow the instructions given to them by the supervisor when participating in fieldwork or excursions. The students are required to act properly and look after their own safety as well as the safety of their fellow students throughout the work. The students are also required to participate in safety courses arranged for students at UNIS. Students are required to present a personal "Self-declaration of Health condition" before commencing studies at UNIS (see Annex).

3. General Requirements

3.1 Employer Requirements

Employees at UNIS who are responsible for the completion of the fieldwork and excursion or participate with joint responsibility in such activity must have necessary competence in

- life saving first-aid
- use of proper communication and navigation equipment (radio, map and compass) as well as emergency beacons and satellite phone.
- safe use of a rifle to be used in self-defence against polar bears
- safe use of rubber boats/small boats with outboard engines, safety equipment such as life-jackets and survival suits, as well as capable of performing small repairs in the field.
- safe use of snowmobile, as well as small repairs in the field
- safe establishment of a camp with special considerations taken with regards to polar bears.

The employees must also be familiar with the equipment from the Norwegian Polar (NP) Institute's Equipment Department that may be used during the activities. The employees

must also be familiar with the content of NP's field book as well as the rules governing the environment and cultural heritage of Svalbard.

UNIS is responsible for offering such instructions

3.2 Student Requirements

Students at UNIS must have adequate knowledge of the use of rifles for self-defence against polar bears. They must also be familiar with:

- how to prevent polar bear encounters
- safe use of and rules of conduct in a rubber boat/small boat
- safe use of snowmobile
- knowledge of safe hiking techniques, especially when it comes to dangers associated with glaciers and calving of glaciers, as well as crossing glacier rivers.
- safe establishment of a camp with special considerations taken with regards to polar bears.
- rules and regulations regulating hiking and activities of such a nature on Svalbard
- use of radio communications equipment and emergency beacons
- use of map and compass
- first aid

UNIS is responsible for offering such instructions.

4. RULES FOR VARIOUS TYPES OF ACTIVITIES

4.1 General

Two or more people shall be together when out in the field or out on excursions. All fieldwork participants are expected to exercise the general common sense rules in the mountains and at sea.

Use of alcohol or any kind of drug is not allowed during UNIS fieldwork or cruises. After finishing a day of field work, one glass of wine or one beer can be accepted consumed as long as the responsible field supervisor find that this is not posing any threat to the general safety.

4.2 Preparations for fieldwork and excursions

Before initiation of any fieldwork one have to fill out an activity plan. This plan must include the name of the supervisor, co-workers and potentially students, planned route, time schedule, notification plan, transport and route-description. The Supervisor submit this plan to the person in charge of the safety issues at UNIS for revision and approval minimum a week before departure. By departure use the form entitled "HSE (safety, health and environment) Notification Form for Field Work and Excursions at UNIS.
As a last preparation before starting the fieldwork, the whole group need to go through a HSE (safety, health and environment) brief with the head of safety and logistics.

Before departure the Safety Supervisor and Fieldwork/ Excursion Supervisor must review the "Emergency Action Plan for UNIS" (see Annex).

All participants in fieldwork and excursion will be given the packed entitled "*Safety Instructions for Fieldwork and Excursions and Instructions for Use of Field Equipment*" with a form acknowledging the receipt of this packet. The participants must sign this form indicating their receipt and understanding of the packet. The signatory also acknowledges the receipt of necessary safety training.

Before the initiation of the fieldwork/excursions, it must be made clear which participants have an employee (and the responsibilities that go along with this) relationship with UNIS. Written documentation of this must exist.

Thorough planning and preparation is the foundation for a successful field excursion. Supply roads are long and supplying equipment out in the field is both expensive and time consuming. Prepare a list of equipment needed for the trip. Make sure you do not forget anything. Remember to plan how you are going to pack the equipment. You may want to try to pack the equipment some time in advance. Pay attention to the packing: consider the need for watertight/shock-proof packaging. Also consider the need for carrying straps and the possible need of having to lift the equipment with a hook.
It is important to pay attention to the volume and weight of the equipment. It is important that these variables agree with the means of transportation that will be utilised. Co-ordinate your activities with other members of the group well in advance. Not all preparations may be taken care of on the fly!

Make sure that you have the required permissions from the Governor on Svalbard when it comes to protection of environmental and cultural heritage on Svalbard.

4.3 Equipment

The supervisor of the fieldwork/excursions, or the person that has been given this responsibility, must make sure that the participants are properly outfitted and equipped before the start of the fieldwork/excursions. The supervisor must also make sure that adequate safety and field equipment is brought along. This equipment must be inspected and checked to make sure it is in good working condition.
Required safety equipment includes an emergency box or bag, rifles for self-defence against polar bears, pyrotechnical aids for safeguarding the camp, map and compass, and communications equipment. There must be enough rifles brought along to allow for polar bear protection for all the activities that will be engaged in during the fieldwork/excursion.

Choose equipment that is able to endure the climatic conditions that may be encountered on Svalbard. This especially includes equipment such as tent, sleeping bags, and clothing. Seek advice when in doubt! Make your own checklist, or use the proposed list attached to this packet. Take your time to review the checklist one last time, even though your fellow participants are eager to get started.

You are often required to solve problems that may appear by yourself with the limited resources at hand. It is therefore important to make sure that you spend enough time to plan for and prepare yourself for any unforeseeable events that may occur.

Consider bringing a large tent if you plan to use the tent as a working place. A large tent may allow you to sit up right and work by a table. It is easy to get tired of working on a PC in your lap in a tunnel tent.

4.4 Polar Bear

The polar bear is a protected species on Svalbard. No shots may therefore be fired against a polar bear. The only exception is in self-defence.

Keep your distance to the polar bear. Never attempt to seek out places frequently visited by polar bears or places where polar bears have previously been observed.

The Governor's Office on Svalbard shall always be informed when a polar bear has been killed or shot at.

Do not hide or keep quiet when a polar bear has been observed. Make sure that the rifle is loaded and ready for use. The magazine of the rifle should be completely filled with ammunition. Leave the area immediately. Try to scare the bear if this is not possible. Scaring the bear may be accomplished through engine noise, light blink from a signal gun, or by firing warning rounds with the rifle. Make sure that the shots are fired well above or well to the side of the polar bear when using the rifle to scare the bear. This is to prevent injuring the polar bear. After firing the warning shot, be careful to reload the weapon with ammunition in the magazine.

A signal gun should either be aimed just in front of the polar bear (such that it is not scared towards you) or straight at it. When many people are out in the field it is recommended to divide up the tasks. One person should be responsible for the rifle while other people use signal guns, fire crackers or make noise to scare off the bear. Make sure that all people are kept well away from the line of sight of the rifle. Prepare to kill the polar bear if it shows no signs of retreat. Aim towards the shoulders, not towards the head. Do not approach the bear before you are absolutely sure it is dead.

Great care must be taken when establishing a camp in order to prevent polar bear attacks. One may stand guard or put up trip wires around the camp.

4.5 Emergency Tool Kits

Emergency tool kits should always accompany field excursions involving snow mobile, small boats or helicopters. The kits are sealed and shall only be used in emergency situations.
Familiarise yourself with the content of the emergency tool kits before the start of the fieldwork / excursions, especially for the tent, stove and the trip wires.
Always carry the "glacier rescue kit" on snowmobile excursions that will cross glaciers or sea ice.

<u>Contents emergency tool kits UNIS, winter, large: (5 people to survive 3 days)</u>

- 1 Tent
- 3 Tyin 200 sleeping bags

- 2 Sleeping pad
- 1 Maglite flash light with 2 batteries
- 1 Snow shovel
- 1 First aid kit
- 1 Gasoiline stove (Will burn about 18-20 hours)
- 1 Primus casserole
- 1 Primus frying pan
- 4 Boxes of matches in watertight container
- 1 Wind safe matches
- 2 Plastic cups
- 1 Trip wire kit with 4 flares
- 2 Wind tight bag
- 6 Packs of 24 hours emergency rations.
- 1 Box, drinking powder.
- 2 Avalanche search poles

Contents emergency tool kit UNIS, winter, small: (3 people to survive 2 days)

- 1 Tent
- 1 Wind tight bag.
- 1 Sleeping bag
- 2 Sleeping pad
- 1 Gasoline stove type.
- 1 Litre fuel
- 1 Casserole
- 2 Plastic cups
- 1 Box of matches
- 2 Packs of 24 hour emergency rations.
- 1 Trip wire kit with 4 flares
- 1 First aid equipment
- 1 Snow shovel
- 1 Avalanche search pole
- 1 Box, drinking powder.

Contents emergency tool kits UNIS, summer: (2 people to survive 2 days)

- 1 *Fjellduken*, isolated wind tight bag

- 4 Sitting pads
- 1 First aid kit
- 2 Boxes of matches/wind safe matches in watertight container
- 1 Trip wire with 4 flares
- 4 Packs of 24 hours emergency rations
- 2 Plastic cups

Content of "Glacier rescue kit" UNIS:

- 1 Rope, 9mm, 100m, static.
- 1 Rope, 11mm, 50m, static.
- 1 Rope, 6mm, 6m, static.
- 2 Search probes (240cm)
- 2 Rope clamp / grab, Jumar
- 1 Rope clamp / grab, croll
- 1 Descender, figure 8.
- 1 Descender, sticht
- 6 Locking gate carabiner
- 5 Carabiner
- 6 Sling, 120cm.
- 1 Harness.
- 1 Chest harness.
- 1 Rope for connecting harness.
- 1 Rescue harness, triangle.
- 1 Ice axe
- 2 Helmet
- 2 Headlamp with spare battery
- 6 Ice screw.
- 2 Swing side pulley
- 1 Swing side double pulley

The "Glacier rescue kit" is split in two separate boxes and should be carried in the front and at the back of the snow scooter column.

4.6 Setting Up a Camp

Deciding on a location for the camp is important. You may want to talk to locals and people that have camped in the area beforehand for suggestions. The Norwegian Polar Institute has an extensive record of previous researchers and where they have been.

Important factors to consider:

- Dominating winds in the area. The camp should be situated out of the reach of the wind.
- Access to drinking water. Use a source of running water situated at a higher elevation than the camp.
- The terrain. Should be dry (Stay away from moss). Preferably at an incline due to drainage.
- Communication conditions (boat, helicopter, snowmobile and radio). Considering docking options for larger vessels, landing conditions for rubber boats and landing space for helicopters, radio communications.

- Watch out for areas commonly visited by polar bears (close to the ocean, drift ice). Unfamiliar objects in the terrain will attract polar bears. Be sure to establish your camp well a way from the sea or sea ice.
- Always store fuel (gasoline, paraffin, methylated spirit) in approved containers, and always know where everything is. Store gasoline in red containers and paraffin in green containers (Or green containers painted red). Keep a good distance between the fuel and the tent and provisions in the camp. Also keep a good distance between the tents because of potential fire hazards. Consider the need for a fire extinguisher.
- Consider the need for a tent dedicated for provisions, for cooking food, and eating. In addition to the social aspects of meals it is important to remember that the polar bear is attracted to places where food is kept or where food has been cooked.
- Keep your food supplies stored well a way from the tent camp and in line of sight from the tent opening.
- Also establish your latrine facilities well away from the camp.

4.7 Fire Prevention in the Field

A fire may quickly unfold to become a catastrophe. Anyone who has observed fire in a tent knows that thing happen very fast. It is important that fire prevention is thoroughly planned and that it be respected and followed by all participants.

The best way of averting fires is to prevent the start of fires in the first place. This may be accomplished by organising the camp and stipulating clear rules regarding handling of flammable goods and sources of fire. Think about the ways you cook your food and dry your clothes. Make sure everyone in the camp is familiar with the fire warning routines. Everyone should be aware of the location of the fire extinguisher and how to use it. Consider smoke detectors in the tents.

Do one or more of the following to put out a fire:

- Remove fire prone or combustible material
- Cool down the flammable material
- Prevent the supply of oxygen

Water is the most important tool for cooling down flammable material (This includes burnt people). Make sure that water is easily available. Consider having a small supply of water in the camp for this purpose.

Another way to put out fire in the field is using a powder fire extinguisher. This has a choking and cooling effect on the fire. The apparatus has a limited lifetime (on the order of seconds) and it should be used carefully. Aim the powder towards the core of the fire with quick motions back and forth.

Sand, soil, blankets and clothing may also be used to put out a fire.

4.8 General First Aid

It is important to know the main principles of first aid before going out in the field. One should know the content of the first aid kits and be familiar with the use of the equipment.

When the need for first aid arises, it is important to act fast without forgetting the rule: *OBSERVE - THINK - ACT*.
Don't initiate treatment before you have obtained an overview of the situation and before you have contemplated which treatment will be the most effective.

Order of Events for Life Saving First Aid:

- Provide for your own safety.
- Obtain an overview of the site of the accident (How many are injured?)
- Controlling consciousness
- Free the airways
- Control breathing
- Control the pulse
- Seek help (If this is possible within the time frame for the given situation)
- Start the required treatment

4.9 Transport to and from the KHO (Kjell Henriksen Observatory) / EISCAT / the MAB-station

The following applies in the wintertime:
When driving to and from KHO / EISCAT / MAB-station one have to establish contact with The person on duty at UNIS. A rifle shall be brought along for walking between the car and the station building if the distance up to the station building can not be traversed by car.
Never leave the car by foot outside the population after an unintended stop if you haven't got a rifle for polar bear protection with you

5. USE OF EQUIPMENT IN THE FIELD

5.1 General Instructions for Use of Various Equipment at UNIS

These set of instructions aim to help maintain the standard of the field equipment that exists such that the equipment always satisfies its safety and functional requirements. This implies that students and employees must take well care of the equipment and make sure that it is ready for the next user.
In case of inappropriate use, breach of the user instructions or other rules, or negligence resulting in loss or damage to materials, the person or persons concerned may be held financially liable for part or all of the amount required to replace the damage or loss. Please take the necessary steps to fix the equipment if you notice something is wrong or something is missing. This also applies to equipment rented or managed by UNIS.

The user is responsible for familiarising him or her with the equipment before use. Most of the equipment has instruction manuals.

Some equipment requires special training before they can be used. It is an absolute requirement that people using rifles have undergone an approved training course. Users of snowmobiles, rubber boats/small boats, and communication equipment are required to have participated in instructions approved by UNIS.

Field operations are not complete before all the equipment has properly been put away and stored. The equipment should be returned to the UNIS buildings, be cleaned, maintained and be put away as soon as possible. The fieldwork / excursion supervisor is responsible for making sure that the equipment is not left in the garage, in labs, etc. long after the completion of the fieldwork / excursion.

Lost or damaged equipment requires filling out of a damage report. (See Annex)

5.2 Routines with Checking Out and Returning Equipment at UNIS

All equipment that will be used into the field shall be checked out and noted on a separate checkout form.

The person responsible for the course or prospective supervisor shall request equipment. On every requisition there have to be an UNIS project number.

The corresponding deadline for the winter/spring season is **15. January**
The corresponding deadline for the summer/autumn season is **15 April**.

If the checkout form come to late you can not be sure that the equipment will be available.

All equipment shall be cleaned before it is returned. The equipment should be returned to the equipment personnel. Faulty or missing equipment shall be noted on a damage report.

A separate checklist must be filled out for snowmobiles and small boats.

A copy of the requisition form will accompany the equipment. This form should be used to verify the equipment upon return.
Returned equipment shall preferably be grouped according to the requisition number and must always reference the specific requisition.

5.3 Use of Automobile

The cars that belong to UNIS shall only be driven by employees of UNIS.

The following applies during the wintertime:

There shall be snowmobile suits, gloves, and hats for everyone in the vehicle when driving outside of town.
Never leave the car by foot outside the population after an unintended stop if you haven't got a rifle for polar bear protection with you

The equipment box in the car shall contain the following:
- 2 sets of snowmobile suits, gloves, and hats
- Shovel
- Towing rope
- Jumper cable
- Flashlight
- Signal pen with ammunition.

Each vehicle shall always carry a fuel can with 5 L fuel.

Emergency lights shall be turned on immediately if the car stops in bad weather.

5.4 Use of rubber boats and small boats

UNIS has got several smaller boats of different types.

The small boat shall only be used for scientific purposes. This implies fieldwork in connection with instruction, graduate studies or research.

The person driving the boat shall have gone through boat training courses approved by UNIS before use. The person responsible for driving the boat shall always be using an approved survival suit.

The rubber boat has a maximum capacity of 5 people and a maximum load of 1000-kg (e.g. 5 people and a 600 kg. load).
The aluminium boat has a maximum capacity of 6 people and a maximum load of 450-kg (e.g. 6 people and a 0-kg. load). The aluminium boat is equipped with remote control.
The fieldwork / excursion supervisor is responsible for making sure that the number of people and the load is in compliance with the boat being used.

The following safety equipment shall always be brought along when using rubber boats / small boats:

- Survival suits for everyone on board (Must be used)
- Emergency tool kit (See section 4.5 for the content of this tool kit) that should be attached to the boat using a rope.
- Rifle (Stored unloaded onboard the boat) for self-defence against polar bears.
- Signal gun or signal pen with corresponding cartridges
- Trip wires for safeguarding the camp.
- Communications equipment.
- Map and compass.

The supervisor may allow deviations from the above rules under exceptional good weather conditions with little wind and little waves. This may, for example, occur when passengers are disembarking from larger vessels where the distance from the boat to shore

is small. The passengers shall in these cases be wearing flotation garments (regatta suits). The person responsible for driving the boat shall in all cases be using an approved survival suit.

Always bring along spare parts for the boat and the engine. Every boat has a separate box that contains spare parts and tools. The box shall contain the following equipment (an inventory list may also be found in the lid of the box):

- Grapnel with 2 shackle and 20 m rope or chain.
- Radar deflector (not the aluminium boat)
- Skid for taking the boat ashore (not the aluminium boat)
- Sea anchor
- Repair kit for the rubber boat:
  - metal stopper
  - manometer
  - valve washer
  - valve
  - aft valve
  - various patches
  - glue
  - whetstone
  - brush
  - sand paper
- Repair kit for the engine:
  - safety line
  - pins
  - 3 spark plugs
  - impeller
  - propeller
- Tools:
  - Hazet socket/drive set
  - knife
  - pair of tongs
  - a pair of nippers
  - screwdrivers: 1 large flat and 1 large Philips
  - spark plug key
- Funnel with filter
- Baler
- Pump (not the aluminium boat)
- Rope

The box containing the spare parts and tools for the boat shall be attached to the boat using a rope.

Before Starting the Engine

- Make sure that all the spare parts and tools are present in the boat tool kit. An inventory list may be found inside the lid of the box.

- The back-up engine must only be given petrol filled with oil. Oil should be poured into the petrol tank before the petrol. Mix the fuel well by shaking the petrol tank. **Always make sure that the two engines get the right proportion of oil and petrol.** Incorrect mixing proportion may lead to engine failure. The main engine has a separate oil tank (autolube). Control and fill up when needed.

- It is forbidden to use open flames or smoke when handling petrol.

- Check the engine attachment by tightening the attachment screws. Make sure that the engine is attached using a safety chain or wire from the safety attachment point (Next to the attachment screws) to a safe connection point on the boat.
- Connect the emergency strap between the emergency stop on the engine and the boatman before attempting to start the engine.

- Attempt to start both engines to make sure they work.

- Let the engine run on idle until it runs clean. Make sure that water is running from the cooling outlet. Stop the engine if this is not the case. Check if the cooling outlet next to gear housing is blocked. The engine must be brought in for service if no obstacles are found.

While the Engine is in Use

- Make sure the trim angle on the engine has been properly adjusted. Reducing the trim angle in large head winds increases the turning stability of the boat. The opposite is true when experiencing large tail winds: increase the trim angle to increase the turning stability of the boat. Move the pin towards the attachment plate in order to lower the bow. Move the pin away from the attachment plate to elevate the bow

- The engine shall be locked into position under normal driving conditions. The engine should remain unlocked and driven at low RPM when driving in shallow water. Be aware that the engine may jerk upwards if you drive the engine in reverse with the engine unlocked. The engine tilt lock shall be pushed upwards.

Emergency Start

- To start the engine using the emergency pull string, one must first remove the top cover of the engine. Take out the starter by removing the three bolts holding the rewind spool mechanism for the flywheel. Attach the string using a knot in the notch on the flywheel. The string should be wrapped a couple of times towards the right. Avoid loose clothing. Remember that the engine is not engaged (The engine will not be engaged when the emergency pull string is used). Pull firmly in the string to start. Avoid contact with any of the electrical equipment. This includes the ignition spool, high voltage wires, and the percussion cap.

Docking the Boat

- Always pull the boat further than the reach of high tide and make sure it is secured properly. Remember to use a sufficiently long rope to account for variations in the tide when docking alongside quay.

- The difference between high and low tide on Svalbard is between 1.5 and 2 meters.

- Always use the wheel that attaches to the stern when pulling the rubber boat ashore. Use rounded wooden poles when pulling the aluminium boat ashore. Put these poles about 1.5-2 meters apart.

- The self-bailing valve should be closed when the boat is not moving in the ocean. It may be closed using the two plugs attached to a line in the stern. Clean the plugs for any dirt or debris following each trip.

Returning the Boat to Shore

- Properly secure the boat when coming ashore. The rubber boat should be pulled ashore using the accompanying wheels or skids. Attach it properly using ropes. The aluminium boat should be docked to a buoy or put on onto a hanger.
- Detach the petrol line from the engine.
- Tilt the engine using the engine tilt locking mechanism.
- Remove all the equipment from the boat and bring it back to UNIS. Garbage or litter shall not be left in the boat.
- Additional petrol cans shall be returned to UNIS and placed in or next to the green box.
- Clean the boat. It would be appreciated if you removed the deck flooring and cleaned the rubber boat for debris and gravel.
- Fill the engine in the aluminium boat (autolube) with oil and petrol. Lock the petrol can in the boat. Petrol cans for the rubber boat should be brought back to UNIS.
- Check the boat for external damage.
- Check the engine for external damage (propeller, gear housing, etc.)
- Fill out the "Check in Form for Rubber Boat / Small Boat" and the damage report (the latter only if necessary). Return the checklist / damage report and the keys to the person responsible for the equipment after use. Put this in the mailbox in the reception area after regular business hours.
- Survival suits and life jackets should be rinsed in fresh water and let dry. Lubricate the zippers using proper lubrication. The suits should be returned where they were found when dry.

Air Pressure in Rubber Boat

Control the air pressure in the rubber boat on a daily basis when out in the field.

The rubber boat is always filled with air at the start of the season. It is important, however, that the air pressure be controlled before the start of any excursion. The manometer may be found in the boat tool kit. There are two valves in the rear of the boat such that one may monitor the pressure while filling the boat with air.
Remember the following when controlling the pressure and refilling with air:

- Turn the valves such that they allow air to flow freely between the two chambers in the boat (The valves should be set to "INTER-KOMMUNIKASJON").

- There are numerous ways to connect the air tube to the actual pump. Put the tube in the hole marked 150-300 mbar when it gets difficult to pump.

- Make sure you turn the valves such that no air can flow in-between the two chambers when finished (The valves should be set to "NAVIGATION"). The boat should have an air pressure of 240 mbar, while the keel should have 220 mbar.

5.5 Use of Larger Vessels

These vessels will have their own safety instructions and rescue routines. This is something that all passengers must familiarise themselves with and follow. The fieldwork / excursion supervisor and the captain are jointly responsible for making sure that all passengers are introduced to these instructions and routines. The supervisor and captain must also make sure those obligatory drills and exercises are held.

The Captain is the person in charge on the vessel. All people onboard are required to follow the directions of the captain or a person vested with his responsibilities.
The Supervisor serves as the contact person between the researchers / students and the ship's captain and crew.

All work on deck requires the use of floating garments or life jacket. When working on the deck or in the hold, you must always wear a helmet. It is also recommended that people wear a helmet, reinforced footwear, and working gloves when working on deck or in the cargo bay.

Exercise caution when a crane or hoist is operated on the vessel. Do not walk underneath a raised load! Be on the lookout for potential sources of danger such as steel wire drums, a slippery deck, and open hatches. A good rule of thumb is to stay away unless directly involved in the work being performed.

- All cargo should be properly stowed and secured. This applies both in good and bad weather.
- Close all doors, drawers, and cabinet doors. Protect equipment from falling below deck.
- Take seasickness drugs if you are unsure that you will tolerate the sea.
- Take proper safety measures if you are going to work on deck in bad weather. In bad weather, bad light, or high seas, you are not permitted to stay out on deck alone.
- It is comfortable to be on the bridge. Remember, however, that this is someone else's work place. Stay out of their way.
- Close the porthole when leaving the cabin.

5.6 Use of Snowmobiles

UNIS has several snowmobiles and sledges. In additional to this a number of snowmobiles and sledges are hired.

The UNIS snowmobiles may only be used for scientific use, i.e. fieldwork in connection with instruction, graduate studies or research. Personal use is not allowed.

Everyone driving snowmobiles must have a snowmobile license or a driver's license. The snowmobile driver must also have gone through snowmobile training approved by UNIS.

Field operations require a minimum of two people on two snowmobiles together.

Always wear a helmet when using a snowmobile in connection with UNIS.

There are two scooter free areas around Longyearbyen. Please see attached map. No one under the direction of UNIS are allowed to use snowmobiles in this area without the permission of the UNIS director.

The following safety equipment shall always be brought along for any field operation where snowmobiles are involved:

- Emergency tool kit (See summary of contents in section 4.5)
- Communication equipment
- Rifle for self-defence against polar bears
- Signal pistol with red and brown ammunition.
- Map and compass
- Avalanche search beacon
- Ice spike (if crossing over frozen water or sea)
- Glacier traverse kit (if crossing a glacier or sea ice).

Numerous spare parts must always be brought along when taking trips on Svalbard. This includes a spare clutch drive belt, emergency strap, spark plugs for the scooter, pull bolt, shock absorber, and leg for sledge. The following equipment shall always accompany the snowmobile

- Spark plug key
- Combination screwdriver
- 5/16, 3/8, 7/16, ½, 9/16, 5/8, 11/16 and ¾", as well as two 17 mm wrenches.
- Combination pliers

Ski, poles and proper clothing should also be brought along on longer trips.

If the number of snowmobile trip participants exceeds the capacity of the emergency tool kits, bivouac and equipment must be compensated in other ways. For example: emergency bags offered by the Norwegian Polar Institute and additional tents.

The following is the minimum clothing recommended:

- Wool underwear
- Layered clothing of wool or fleece. Cotton is not recommended.
- Snowmobile suit with hood and brim
- snowmobile glasses
- snowmobile gloves made out of skin
- hood and fur hat
- face mask
- snowmobile boots

- Scooter helmet.

Before Starting the Snowmobile

Check the following:
- Snow in the air intake, engine room, and belt
- Full tank of petrol and oil
- Accelerator moves freely in and out
- Ski and belt are not frozen to the ground. Lift the sled attachment of the scooter onto a petrol can and let the belt rotate freely a couple of times
- The engine should be sufficiently warm before driving. Let the engine run on idle sufficiently long such that the engine runs smoothly without requiring additional acceleration. Remember choke when the engine is cold
- Never take for granted the safety of existing trails across sea ice. Obtain information on the sea ice conditions at the Governor's Office or the Norwegian Polar Institute.

Operating the Snowmobile

- Adjust your speed according to given driving conditions. Keep an eye on other drivers in your team. Decide the order of who shall be driving first and last.
- Lower your speed during low visibility (whiteouts or snowstorms). Stop the snowmobile under extremely difficult driving conditions. Wait and contemplate the situation. Return if possible. Put up an emergency camp if this is not an option.
- Special permission is required from the Governor's Office before entering protected areas.
- Follow existing scooter trails whenever possible. There are maps over the Nordenskjöld area that show the more commonly used snowmobile trails.

Exercise caution when venturing beyond the marked trails. This especially applies on glaciers, sea ice and in irregular terrain. The potential for avalanche is often high in lee sides, small river valleys and along steep overhangs.
- Remember to give the right away to pedestrians in towns and in the terrain. Do not disturb animals more than necessary.
- Driving under the influence of drug or alcohol is strictly illegal.
- Speed limits: On the road: 30km/h, outside the road in Longyearbyen: 30km/h, in the terrain: 80km/h.

Returning the Snowmobile

- Place the snowmobile on a pallet with a petrol can under the sled connection

- Remove snow, ice, and any other objects from the belt
- Inspect the body of the snowmobile and the belt drive systems (belt, guide wheels, shock absorbers, bolts, springs).
- Check the tightness of the drive belt.
- Control the clutch drive belt, attachment for the manifold, and the carburettor.
- Check the steering ski, and the steering transmission system for damage.
- Make sure the petrol cans and oil tank is filled with oil.
- Cover the snowmobile with the snowmobile cover.
- Place the petrol/paraffin cans next to the green box located on the East Side of the UNIS building.
- Empty oilcans should be put in the garbage container. Remaining oil should be stored in a marked box inside the building.
- Unload the sled and bring all the field equipment into the building.
- Tilt the sled on its side and inspect it for damage (skis, attachments, shock absorbers, etc.)
- Fill out the Snowmobile checklist. The damage report should be filled out if necessary.

Loading of the Sled

It is important that the load is stacked and secured correctly. This will minimise damage to the sled and load under transport, and prevent the load from moving around. The sled and not the snowmobile (Maximum 5-kg at the sled attachment) should carry the weight of the load. This is accomplished by placing the load above the shock absorbers on the sled.

- Always use heavy-duty lash-straps or ropes. Retighten periodically.
- Always place petrol/paraffin cans with the right side up. Check for leaks in the cans before loading onto the sled.

5.7 Utilising Helicopters

Planning

Helicopters are an effective means of transport. They are expensive, however, and the use of helicopters demands planning to minimise time consumption.

You typically pay for the effective flying times from take off to landing for flights of shorter duration. You also pay for ground stops when the rotor is in operation. Longer flights may also include room and board.
The helicopter will typically not admit passengers when carrying hanging cargo.

The helicopter may not show up at the agreed time. Make sure that you have sufficient equipment and supplies to survive bad weather. This should include an emergency tool kit, or the like. It should also include a rifle.

All passengers (including personnel "just helping out") shall have gone through training that make them familiar with the routines and dangers of using helicopters.
Any lifting operation requires people familiar with helicopter sign language to communicate with the pilot.

Ordering Helicopter Services

This is the responsibility of the technical department at UNIS and must include the following information:

- Departure time
- Where to meet
- Flight plan
- Name of the passengers and volume of luggage
- Potential intermediate landings and waiting time
- The need for cargo net, straps, etc.
- Information about dangerous goods, e.g. explosives, propane, petrol, etc.

Remember to inform the Helicopter Company if you are bringing heavy, irregularly sized or large amounts of equipment.

Landing Ground Requirements in the Field

- The landing ground shall be free of any objects that may be whirled up into the air.
- The ground must be firm and free of sharp rocks.
- The distance to the camp must be more than 40 meters.
- Make sure no antennas; tripwires, etc. are present in the area.

Arrival of Helicopters

- Ready the landing ground
- Have on ground personnel hold their baggage when the helicopter arrives.
- The wind direction on the ground is communicated to the pilot through a designated person standing on the ground with his back against the wind. This person should hold his arms above his head and be situated at the outskirts of the landing ground. The pilot may keep this person as a reference point during landing if snow is whirled

up into the air. It is therefore important that this person remains stationary and gets down on his knees when as the helicopter are approaching. The person designated to communicate the wind direction to the pilot may elect to use scooter glasses to protect his eyes against blowing snow and dust.

- People not communicating the wind direction to the pilot should stay low in the terrain and remain together.

Summary of Hazards Associated with Helicopters

The main rotor may reach close enough to the ground to hit bystanders. Pay special attention to this in sloped terrain. Also remember that long objects may easily get into the path of the main rotor.
The Tail Rotor is difficult to see when it is rotating. Moving further back than the last door on the helicopter is therefore strictly forbidden as long as the engine is operating.

The Wind from the rotors may whirl up objects that may hit the rotors or bystanders.

Safety Guidelines for Using Helicopters:

- **Keep calm when operating inside and in the vicinity of the helicopter.** It is easy to get exited as the helicopter approaches. This may lead to uncoordinated and dangerous situations. There are small margins between success and failure.
- **Remove all loose objects from the landing ground** to make sure these objects are not whirled into the rotor or hits bystanders.
- **The pilot should always be able to see you** when manoeuvring near the ground.
- **The pilot is in charge**. He is the one that decides when you may enter and leave the helicopter. Thumbs up: come! Thumbs down: stop and wait! The pilot decides where the luggage should be stowed. He also decides what luggage may be brought along on the trip.
- **Bend down when moving to and from the helicopter.** The rotor may seem to move in a plane, it may actually move quite some distance up and down. Do not move away from the helicopter until it has taken off when it lands in sloped terrain. Stay low and wait. When landing in sloped terrain it may be necessary for the pilot to land close to the passengers. Remain where you are and do not approach the helicopter until the pilot signals that it is safe to do so.
- **Never move further back than the back door on the helicopter** to prevent being hit by the tail rotor. Make a large detour around the tail end of the helicopter if it is absolutely necessary to move behind the craft.
- **Never throw anything in the vicinity of the helicopter**. This object may be sucked into the rotor creating a dangerous situation.
- **Baggage and equipment that you are carrying must never extend higher than your head.** Remember to carry long objects in a horizontal direction. Keep this rule in mind when you attach or detach exterior cargo.
- **Be careful with the door**. Do not leave a door half-open. The door should normally be closed during flight.
- **Dogs shall be on a leash or contained in a transport box** when inside or in the proximity of the helicopter.
- **Always use seat belts and ear protectors (preferably with intercoms) when onboard.**

- **Smoking and all sources of fire are not allowed onboard or in the vicinity of the helicopter.**
- **Use a ground cable when attaching exterior cargo**
- **During an emergency landing:**
  Follow the instructions of the pilot.
  Put on flotation aids if ordered by the pilot when flying over water.

5.8 Map and Compass

A map and a compass shall always be brought along during fieldwork / excursions.
GPS is considered a supplemental tool, but never a replacement for a map and a compass.

The main map series on Svalbard exists on the scale 1:100,000. The exception is Bjørnøya where the map scale is 50,000. This series consists of 65 maps, some of which are still provisional.
The series is constructed according to UTM (Universal Transversal Mercator). The grids on the map are 10km by 10km. There is also a geographical reference system with lines every 10' latitude and every 20' longitude.
The horizontal datum is ED-50. The vertical datum is mean tide level.
Topographic features are the main information that may be gathered from the maps. The contour lines of equal height are 50 meters apart. They are sometimes only 25 meters apart (especially near the coastline) to give additional information about the topography. The maps also contain information about rivers, glaciers, coasts, etc. Most of the cabins (with the exception of the newer ones) are depicted on the map. Please be aware that some of the cabins may be damaged.
Note that the terrain around glaciers are constantly changing and may not fully agree with the map.

Topographic maps are also available on the scale 1:250,000. Only one of these maps has been published at this point. This map covers the Spitsbergen area. This series, with a total of 3 maps covering all of Svalbard, is expected to be complete by the end of 1997.

A small-scale map exists on the scale 1:500,000 (4 maps), 1:1 mil. (1 map), and 1:2 mil. (1 map).

Tourism maps have been created over the Nordenskiöld to a scale of 1:200,000.
Large-scale maps (economical and technical) have been made for some of the areas around the mines. The Brøgger peninsula is the only area that has continuous map coverage down to a scale of 1:10,000.

Specific subject maps exists in different series on a scale between 1:100,000 to 1:250,000.

Ocean maps exist on a scale between 1:100,000 to 1:2 mil. These maps also include some simplified topography over some land areas. Be aware that the depths specified on these maps may not always be accurate. Most maps include ED-50 datum. Some older maps also have locally defined datum. Some ocean maps are also based on the WGS84 datum system, i.e. the same co-ordinate systems used by the GPS satellites.

Air Photographs exist for most of the Svalbard archipelago. Copies of these pictures may be purchased from the Norwegian Polar Institute.

Compass
The deviations in the central parts of Spitsbergen are close to zero. Deviations are observed, however, from approximately 3º west on Prins Karl's Forland to about 12º east on Kvitøya.

GPS
Hand held GPS receivers are typified by large power consumption. This means that they will require a lot of batteries unless provided with an external power source.

5.9 Instructions for Use of Rifles and Pyrotechnical Aids

A calibre 308 or higher weapon is recommended for self-defence against polar bears

Rifle Instructions

UNIS owns several rifles in calibre.30-06 that may be used by students and staff. These rifles are financed by welfare funds and may be checked out if available.

As a main rule UNIS do not lend out rifles to persons that have not participated in the rifle safety-course at UNIS.
The director may grant exceptions from this.
A separate form must be filled out before the rifles may be checked out in this case.
The following set of instructions also applies to rifles rented /lend external. Please note that these rifles could be of a different calibre.

You are not permitted to sublease or loan UNIS weapons to persons who have not taken the UNIS weapons handling course or who are not connected with UNIS.

On camping trips where alcohol is consumed and a UNIS weapon is carried, one of the party shall be appointed Safety Supervisor in charge of the gun and party safety.
You are not permitted to handle guns, ammunition or pyrotechnics while under the influence of alcohol or any kind of drug.

Compassionate weapon can be checked out with the person at UNIS in charge of safety issues.
Please show courtesy and return the rifles after use, as they are in high demand.

Checking Out and Returning Rifles

The user must always verify the following when checking out and returning rifles:

- Always check that you have the correct ammunition with lead tip
- The weapon is free for ammunition (Both the chamber and the magasin). This also applies when obtaining a weapon from someone else.
- There is no external damage to the weapon. Pay close attention to the sight and related components.

- There is no apparent damage to the chamber, cartridge, or the cartridge spring. Also, check that the bolt, safety lock, and the trigger work properly
- The weapon is cleaned and oiled. The rifle must be dried off before it can be brought into the field. This is to make sure that the rifle works properly, and is especially important in cold weather.
- Fill out a damage report in case something is broken or missing on the rifle.

Use of Rifles

- Never point the weapon toward someone else, even though it is not loaded.
- Carrying loaded weapons in densely build up areas is strictly prohibited. This means that you should have no rounds in the chamber or the cartridge.
- To signalise that the weapon are under control the weapon must always be carried over you shoulder or in a sack. Indoors and in Longyearbyen the bolt must be in back position.
- The weapon shall always be locked up while in storage and not in use. The rifle, ammunition, and the bolt shall all be stored separately.
- Carrying loaded weapons in densely populated areas is forbidden. This means that you should have no rounds in the chamber or the cartridge. Always remove the bolt and keep it in your pocket.
- As a main rule we <u>never load or half load</u> the rifle when we go out on fieldwork. In special situations the excursion leader can order half loading. Half loading and later emptying of rifles must be done under supervision of the excursion leader.
- Ammunition shall be stored on the rifle stock, in a cartridge holster or easy accessible in a pocket.
- Half loading is accomplished by pushing the upper round into the magazine while inserting the bolt (making sure that the upper round does not enter the chamber). Point the weapon up into the air and pull the trigger. The rifle is now half loaded. One must go through the loading motions in order to load the weapon.
- Always make sure that the weapon is ready for use. Be aware that snow, ice or sand may block the functions of the rifle.
- Rifle maintenance consists of cleaning (dry, without oil in the wintertime), visual inspection and verifying the functionality of the rifle without ammunition. This should be performed daily.
- Care must be taken while transporting the rifles. Always carry the weapon, and avoid fastening the rifle to your backpack or sled. When putting down the weapon, place it such that it will not fall or be damaged when you are not carrying it.

GUN STORAGE

See “Act relating to storage of guns” of 9 June 1961.

- Store the bolt, gun and ammunition separately. Each accommodation unit is provided with a lockable gun rack. Lock the gun in the rack, remove the bolt, and lock up separately. Store ammunition under lock and key away from the weapon.
- At UNIS gun racks are provided for temporary gun storage.

- When storing a gun in a cabin or tent where a higher level of contingency is required on account of polar bears, it may be necessary to store the gun half loaded. All party members must know where the gun is stored, and a gun supervisor shall be appointed to take charge of the weapon. Extreme caution must be observed in such cases.
- Remember that a change from warm to cold surroundings will cause condensation in the gun. If this freezes, the mechanism will jam and functionality will be compromised.

Use a cover for the rifle when transporting it on a snowmobile. This is to prevent snow from entering the rifle. It is recommended that the rifle be removed from the cover when stopping the snowmobile.

Breach of the above weapon instructions may result in the loss of your rifle loan privileges.

Signal Guns

There are numerous types of signal guns available. The working principles behind all of these are typically the same.

A signal gun should be used to:

- Give a signal to someone else in the area
- Scare away polar bears

Incorrect use of the signal gun may lead to personal injury.

Description
The weapon should be loaded or emptied by forcing the barrel down. Safety locks may vary from one gun to another. Remember to pull back the cock before pulling the trigger.

There are three types of ammunition:

- Red light cartridges (Red light symbolises emergency and must be used for this purpose only.)
- White light cartridge

- Green light cartridge
- Blitz cartridge

Explosion of a blitz cartridge results in a bright light and a load bang after approximately 90m.

Receiving the Weapon

- Make sure the weapon does not contain any ammunition
- Make sure the weapon is free for external damage
- Check for internal damage (including the barrel)
- Check the operational features of the weapon (trigger)

- Make sure the weapon has been oiled (both inside and outside)

Never keep the gun loaded. The gun should only be loaded when a situation arises that may require the use of the weapon.

Daily Maintenance

- Make sure that the gun is not loaded
- Inspect the weapon (visible damage, barrel, and trigger).
- Clean and oil the weapon when necessary (always after the weapon has been fired). Remember to dry the weapon during winter.

Returning the Weapon

- The weapon shall be cleaned and oiled upon return.
- No ammunition must be present in the gun.
- Fill out a damage report in case something is broken or missing on the gun.

Trip Wires

Trip wires are used to scare away animals from the camp area. Trip wires also serve to warn the presence of animals.
Incorrect usage may lead to personal injury.

Description

Trip wire sets are packaged in sets of 10 or 25 trip wire flares. Each set of flares consist of

- Flare
- Trigger device
- Attachment bracket for the flare
- Trip wire (Spool with 25 meters of steel wire)
- Nails
- Detailed instructions

Use of Trip Wires

The trip wire should be put up well away from the tents. Attach a flare to each trip wire. The splint is removed from the flare when someone pulls the wire. This results in a bright flash and a loud bang. The height of the wire above the ground should be between 50 - 70 cm. The bear may walk across the wire if it is too low. Attach the wire to drift timber or poles that have been brought along. Make sure the posts are well secure.

Be aware that long trip wires (more than 10 meters) may result in unintentional ignition of the flares.

Establish a marked entrance to the camp that everyone uses. This will help prevent anyone unintentionally setting off the flares.

Putting up Trip Wires

- Decide on where to run the trip wire.
- Put up and secure the trip wire posts. Remember that the maximum distance between two posts is 25 meters.
- Affix the installation brackets on the posts at the right height using nails.
- Make sure both splints are inserted in the spring ignition mechanism.
- Remove the plastic cap from the percussion cap on the flare (the thin end).
- Attach the flare onto the installation brackets. Screw the spring ignition mechanism onto the bottom of the flare. Tighten until the flare is firmly attached to the bracket.
- Unspool the wire and attach it onto the post with no flare attached.
- Tighten the wire and attach it to the ignition splint (the splint closest to the flare).
- Remove the safety splint (the bottom most splint)
- Pulling the rope will now set off the flare.
- Do not loose the safety splint or the cap!

Disassembling the Trip Wires

- Insert the safety splint
- Remove the wire from the ignition splint.
- Screw apart the spring ignition mechanism and the flare.
- Put the wire carefully back on the spool.
- Loosen the installation bracket.
- Put everything back in the box.

Maintenance

The spring ignition mechanism requires maintenance a couple of times during the season. Secure the flare using the safety splint. Unscrew the spring mechanism from the flare and take it apart (Remove the splints and watch out for the spring-loaded ignition device). Make sure the mechanism and spring moves freely. Remove any rust or corrosion scale.

Reassembling the mechanism is typically a little more complicated. The spring is tight, but is relatively easy to compress using a pair of pliers. A drop of oil does wonders for the

spring mechanism. Try to assemble one spring mechanism before attempting to disassemble all of them.

Firecrackers

Firecrackers are used to scare away animals. Incorrect use may lead to personal injury.

Description

Firecrackers consist of a small explosive charge and a fuse in a heavy paper casing. A cap that sits over the paper casing protects the fuse. The top of the cap has a scratching surface that is protected by a smaller plastic lid.

Use

- Remove the small plastic lid to expose the scratching surface.
- Remove the large cap to uncover the fuse.
- Ignite the fuse on the scratching surface (just like lighting a match).
- Throw the firecracker towards the animal.
- The firecracker will explode over the next 5 seconds with a load bang.
- If the firecracker does not explode it should not be touched over the next five minutes.
- Keep a distance of at least five meters.

Receipt of Firecrackers

Make sure that the firecracker comes complete with the large cap and the small plastic lid.

Additional Information

Keep the firecrackers as dry as possible. Keep the plastic lid and large cap attached even though the device is not in use.
Aiming or using firecrackers towards humans is strictly illegal. This is also true outside and in tents.

5.10 Instructions for the Use of Radio Equipment at UNIS

The radio links at UNIS occur via the radio frequencies owned by the Norwegian Polar Institute and via public maritime frequencies. All communications shall be in strict accordance with the following instructions.

Authorisation to use: equipment:	Anyone who has been instructed in the use of radio communication equipment at UNIS.
Equipment that	All communication equipment owned by UNIS.
Checkout of equipment:	All equipment should be checked out and picked up from the technical department at UNIS.
Returning equipment:	All equipment should be cleaned and returned to the technical department at UNIS. Attach a damage report if necessary.
Use of equipment:	Follow the instructions for each radio. Use a watertight protection when using radio in a boat or other wet environments.
Channel selection on VHF:	Use channels that do not go through repeaters if possible. **This primarily means channels 5 and 6 owned by the Norwegian Polar Institute.** Channels 2 and 4 (also owned by the Norwegian Polar Institute) should not be used. Be aware that the repeater channels (channel 1, 3 and 7) are batteries driven and usage of these channels should be kept to a minimum. Maritime channel 6 (channel selector 11) is to be used for communications between ships. This channel may be used between a rubber boat and the mother ship. Maritime channel 16 (channel selector 12) is an emergency a call channel. This channel should be used for this purpose only. All ships and most helicopters on Svalbard will listen to channel 16.
Frequency selection MF / HP:	2182 kHz is an international emergency and calling channel, and should be used for this purpose only. Svalbard Radio and larger ships will be listening to this frequency. 3524 kHz main channel of the Norwegian Polar Institute. 7021 kHz may be used if 3524 kHz channel does not work. 10100 kHz may be used if no connection can be established through the other channels. Establishing a connection on other MF / HF channels than 2182 and 3524 kHz requires that the frequency be agreed upon with the radio listening co-ordinator.
Conversations:	The messages shall be short and to the point. Unnecessary usage is not allowed.
Listening co-ordinator:	The person that has been given this responsibility must not leave his post without obtaining a backup.
Diving:	All diving activity shall be performed within communications distance to UNIS or the mother ship (larger vessel with crew that is capable of communications with Longyearbyen). This communication shall occur through the Norwegian Polar Institute's radio links or through Svalbard Radio. There must be a listening co-ordinator at UNIS if the communication is to occur via NP's communication net.

Small boats / Rubber boats:	Always bring communications equipment when using boats.
Snowmobile:	Always brings communications equipment on trips more than one day in duration.
Overnight trips:	Always brings communications equipment on trips that are expected to take more than a day. This includes cabin trips.

Longer field trips:	Field trips more than a day in duration shall maintain daily radio contact to UNIS or somewhere else that will relay messages to UNIS.
Timing:	The timing for all communications with UNIS shall take place within regular business hours if possible. Separate agreements must be made with other listening co-ordinators on the weekends.
Emergency beacon:	Emergency beacons shall only be used when all other means of communications have failed and there is a life threatening or dangerous situation at hand.
Professional secrecy:	All information gathered from listening in on radio conversations are to be kept secret.
General:	Make sure that you are within communication range before a critical situation arises.
Deviations:	Deviations from the above instructions requires prior agreement with the person responsible for radio communications at UNIS.

6. SAFETY TRAINING AND USE OF FIELD EQUIPMENT AT UNIS

UNIS has created a set of courses that deals with safety issues and field equipment that may be offered all students at UNIS. Most of the courses coincide with the start semester. To catch up new students that arrive during the semester, shorter versions of these courses will be offered. The courses will give the participants the required background to participate in the planned field activities.

Semester start Courses:

Course:	Type / duration:	Description:
Safety Course	8 hours	General safety: hiking, clothing General weapon knowledge Rifle, signal gun, trip wires and firecrackers. Polar bear: General biology, behaviour, whereabouts, migration routes. Precautions / how to behave.
First Aid	8 hours	First aid: burns, frost injuries and fractures, treating wounds / stopping bleeding, diarrhoea, frostbite, cooling, reducing pain, transport.

Small boat / Rubber boat	4 hours	Assembly, maintenance, quick / durable patching in the field, safety routines, engine, boat tool kit, survival suits, use of boat and suits.
Snowmobile	8 hours Spring season	Safety routines, use, maintenance, small repairs in the field. Sled: loading, driving with a sled, repairs. Clothing.
Map, compass, GPS	4 hours	Practical use.
Communications	4 hours	Theoretical background, regulations and procedures, practical training.
Nature and Cultural protection	1 hour	Lessons in nature and conservation of the environmental regulations.
Hiking land/glacier	4 hours Spring season	Precautions. Environmental regulations.
Preparations/camp	4 hours	Planning, NP's equipment, setting up a camp, emergency procedures.
Glacier	4 hors	How to travel and conduct rescue work on glaciers
Avalanche	4 hours	Avalanche prone terrain and weather conditions. How to performe rescue work in an avalanche

Courses outside the semester start:

Courses:	**Type / duration:**	**Description:**
Safety Course	11 hours	General safety: hiking, clothing, frost injuries, cooling, resuscitation. Map, compass, communication. General weapon knowledge: Rifle, signal gun, trip wires and firecrackers. Polar bear: General biology, behaviour, whereabouts, migration routes. Precautions / how to behave.

7. LITERATURE

- Norwegian Polar Institute's brochure entitled *Polar Bear, 1994*
- Norwegian Polar Institute's Field Book
- Environmental Regulations for Svalbard.

Longyearbyen 09.12.08.

Gunnar Sand

Director

Fieldwork/ excursion supervisor	
Topic / project name / Code	
Location:	
Time period:	
Object of work:	
Means of transportation:	

"SHE" documentation for field work operations at UNIS

Means of communication, call signals and numbers:		
Satellite phone	Telephone number:	
VHF Radio	Call signal:	Channel:

Cell - phone	Telephone number:
Emergency beacon	UNIS number:

Time of daily contact with UNIS, if out over several days.	
On weekdays:	On Saturday, Sunday or holidays:
Action to be taken from UNIS and the field-party if communication fails:	

Latest time of arrival / return (date and time):	

Contact person at UNIS in this period:	

Routines when returning from fieldwork:	1) Call "Contact person at UNIS" at 95 28 35 11.
	2) Put this form in the "returned" shelter.

Means of communications at UNIS	Radio VHF, UNIS 55540
	Radio, VHS, Contact person UNIS 55542
	Cell-phone, Contact person UNIS 95 28 35 11

Daily excursion plan (time, place and alternative routes). Use more paper if necessary:

Participants:

Name of participant	Date of birth	Function/ category	Connection to UNIS	Address in Longyearbyen (House and room nr.)

The following "SHE issues" has been discussed and agreed on with the field party:

√	***Health issues***	√	***Environmental issues***
	Self declaration on health condition filled out by everyone		Disturbance of wildlife special to the area and time period.
	Appropriate clothing and personal equipment		Waste disposal
	Nutrition, food and drinks		Protected areas
	List of "next of kin"		Cultural heritage
	Alcohol / drugs / medication		Location of camp sites
	Rabies		Flora
	Parasite; "Echinococcus multilocularis"		Need for special applications?
			Field camp
			Tents
	Safety issues in general		Small cabins

	The field parties route		Fire protection
	Weather forecast for the period		CO poisoning
	How to handle bad weather situations		Polar bear protection
	Travelling over / movement on sea ice		
	Travelling over/ movement on glaciers		
	Travelling / movement in mountain sides		
	Travelling/moving in areas exposed to avalanches		
	The Polar bear		
	Routines regarding fire arms and pyrotechnics		
	Travelling / movement on melted Tundra		
	Crossing over rivers		
	Means of communication		
	Communication routines		***Organisation and responsibilities***
	Distribution of safety equipment in the field party		Leadership and responsibilities
			When to report back to UNIS.
			Reports on accidents or near accidents
			Report when driving to and from destination
			Emergency equipment where?
			Preparing equipment before fieldwork
			Restore / cleaning equipment after fieldwork
	Transportation		**Special operations**
	Snow scooters		Diving (see "diving instructions at UNIS")
	Small boats		Handling heavy equipment
	Large vessels		Handling heavy or dangerous machinery
	Helicopter		Use of winch or similar.
	Band wagon		Handling chemicals
	Car		Use of toxic material
	On foot / ski		Need for special safety analyses / SHE analyses?

Emergency equipment following the field party:

√	Equipment	Number	Remarks
	Rifle, cal. .30-06		Front and back of the group
	Ammunition cal. .30-06		
	Signal pistol		Front and back of the group
	Red signal ammunition		
	Brown signal ammunition (Blitz / knall)		
	Fire crackers (knallskudd)		
	Satellite telephone		Carried by the excursion leader
	Emergency beacon		Carried on the body by the excursion leader
	VHF radio		Front and back of the group
	Spare battery pack for radio		
	Battery charger for VHF radio		
	Avalanche search beacon		Everyone
	Glacier rescue set		Front and back of the group

	Emergency box 3 pax (winter)		Front and back of the group
	Emergency box 5 pax (winter)		Front and back of the group
	Emergency backpack 2 pax. (Summer)		
	Scooter rep set		At the back of the group
	Ice rescue spike		Everyone
	Survival suite		Everyone
	Map		
	Compass		
	GPS		

The University centre on Svalbard

Longyearbyen…….
Date

…….. ……
(Signature) Excursion supervisor (Signature) Head of safety

ACKNOWLEDGEMENT OF RECEIPT OF "SAFETY INSTRUCTIONS FOR FIELDWORK AND EXCURSIONS AT UNIS AND INSTRUCTIONS FOR USE OF FIELD EQUIPMENT"

I, the undersigned hereby confirm that I have received the packet entitled "Safety Instructions for fieldwork and excursions and Instructions for Use of Field Equipment". I am aware that I am required to read, understand, and follow these rules and regulations. I am also aware that if I cant understand or not find to leave after this rules I will contact the person in charge of safety issues at UNIS immediately.

I am familiar with the required to follow the directions and guidelines given to me by the supervisor of the fieldwork/excursion, or other people given this authority at UNIS.

Longyearbyen, ...
date

.....
name in printed, capital letters

.....
signature

Information regarding closest relative:

Name:.....

Address:.....

.....

Telephone No.:.....

This form should be completely filled out and submitted to the Head of safety at UNIS

EQUIPMENT LIST / CHECKLIST FOR FIELD OPERATIONS

Use of small boat:	Check:
Survival suits for all participants	
Emergency bag	
Rifle	
Signal gun	
Communications equipment	
First Aid	
Map and Compass	
Boat tool box (spare parts / tools)	
Fuel (petrol, paraffin, methylated spirit, engine oil)	
Depth finder	
GPS	

Use of snowmobile:	
Emergency tool kit	
Electronic avalanche searcher	
Glacier rescue kit	
Communications equipment	
Rifle	
Signal gun	
First aid equipment	
Fuel	
Oil for the snowmobile	
Map og compass	
Spare parts for snowmobile	
Spare parts for sled	
Tools	

Travelling on glaciers / mountains:	
Crampons	
Ice axe	
Rope	
Avalanche beacon	
Ski/boots/poles and proper clothing	

Camp:	Check:
Tent	
Stove	
Paraffin	
Methylated spirits	
Trip wires	
Supply tent	
Fire extinguisher	
Smoke detector	

Supplies:

CHECKLIST FOR USE OF SMALL BOATS / RUBBER BOATS AT UNIS

RETURN DATE:

NAME:

APPROXIMATE ENGINE USAGE (HOURS):

PROJECT:

PLANNED ROUTE:

NOTES:

CHECKLIST UPON RETURN:

- Properly secure the boat. Difference between low and high tide on Svalbard is 1.5-2m. Pull the rubber boat ashore using accompanying wheels or skids. Attach using ropes. Aluminium boat should be docked to a buoy. ☐
- Detach the petrol line from the engine. ☐
- Tilt the engine using the engine tilt locking mechanism. ☐
- Remove all the equipment from the boat and bring it back to UNIS. Garbage or litter shall not be left in the boat. ☐
- Additional petrol cans shall be returned to UNIS and placed in or next to the green box. ☐
- Clean the boat to the best of your ability. It would be appreciated if you remove the deck flooring and clean the rubber boat for debris and gravel. ☐
- Fill the engine in the aluminium boat with oil and petrol. Lock the petrol can in the boat. Petrol cans for the rubber boat should be taken back to UNIS. ☐
- Check the boat for external damage. ☐
- Check the engine for external damage (propeller, gear housing, etc.) ☐
- Fill out a damage report if something is damaged or missing. ☐
- Survival suits and life jackets should be rinsed in fresh water and let dry. Lubricate the zippers using proper lubrication. ☐

Return the checklist / damage report and keys to the person responsible for the equipment after use. This may be put in the mailbox in the reception area after regular business hours.

CHECKLIST FOR USE OF SNOWMOBILES AT UNIS

REGISTRATION NUMBER:

RETURN DATE:

NAME:

MILAGE BEFORE TRIP (in km):

MILAGE AFTER TRIP (in km):

PROJECT:

PLANNED ROUTE:

NOTES:

CHECKLIST UPON RETURN:

- Place the snowmobile on a pallet with a petrol can under the sled connection. ☐
- Remove snow, ice, and any other objects from the belt. ☐
- Inspect the body of the snowmobile and the belt drive system (belt, guide wheels, shock absorbers, bolts, springs). ☐
- Check the tightness of the drive belt ☐
- Control the clutch drive belt, attachment for the manifold, and the carburettor. ☐
- Check the steering ski, and the steering transmission system for damage. ☐
- Refill the fuel tank and oil tank. ☐
- Cover the snowmobile with the snowmobile cover. ☐
- Place the petrol/paraffin cans next to the green box located on the east side of the UNIS building. ☐
- Empty oilcans should be put in the garbage container. Remaining oil should be stored in a marked box inside the building. ☐
- Unload the sled and bring all the field equipment into the building. ☐
- Tilt the sled on its side and inspect it for external damage (skis, attachments, shock absorbers, etc.) ☐
- Fill out a damage report in case something is damaged or missing. ☐