



Atmospheric Radiation Measurement Climate Research Facility/ North Slope of Alaska/Adjacent Arctic Ocean (ACRF/NSA/AAO)

Site Safety Orientation

Purpose

This document provides an overview and summary of safety issues and safe work practices associated with operations at the Atmospheric Radiation Measurement Climate Research Facility/North Slope of Alaska/Adjacent Arctic Ocean (ACRF/NSA/AAO) Sites. It is intended for site visitors as well as routine site personnel and briefly outlines job-related hazards and applicable safety policy for activities at the site. Additional supporting documentation follows this orientation document and is referenced as appropriate in this document. Complete background information on the various safety hazards and work practices summarized here is available in the Atmospheric Radiation Measurement Climate Research Facility/North Slope of Alaska/Adjacent Arctic Ocean ES&H Documents notebook located at the ACRF/NSA/AAO Project Office, the ACRF/NSA/AAO Sites, and at the ACRF/NSA/AAO web pages through the ES&H Documents link. <http://www.arm.gov/sites/nsa/visit.stm>

Hazards That May Be Encountered At The ACRF/NSA/AAO Offices and Field Measurement Sites

You may encounter the following hazards while working at the ACRF/NSA/AAO offices and Duplex in Barrow, and the ARC House in Atqasuk. In addition to the offices, the hazards may be encountered while working at the ACRF/NSA/AAO field measurement sites; the Great White Instrument Shelter in Barrow, and the Pumpkin Instrument Shelter in Atqasuk.

Transportation Hazards – Tracked Vehicle/Snow Cat, Snow Machine & Sled

- Trained drivers only please. If you have a requirement for tracked vehicle/snow cat or snow machine, contact Walter Brower, ACRF/NSA/AAO Site Facilities Manager (907) 367-3820, or Mark Ivey, ACRF/NSA/AAO Site Manager (505) 284-9092 and make arrangements to view a safety training video and go through hands-on training at the Barrow office. The tracked vehicle/snow cat is normally reserved for local ACRF/NSA/AAO personnel use. If use of the tracked vehicle/snow cat is needed, contact Walter Brower.
- Always check the gas/oil level in the snow machine prior to use, particularly during severe weather. It is advisable to visually check the fuel level since the gauge can freeze up and give a false indication. Remember that it is a long walk back to the NARL buildings in a -75F wind chill.
- Ensure that you have adequate cold weather protection for both driver and sled riders. If your snow machine fails, you may find yourself on foot.
- When underway, be careful to avoid protrusions from the tundra (sticks, pipe), as many exist near the track out to the Great White.
- Adjust your speed according to weather conditions. Blowing snow, fog, low-light, or whiteout conditions require extreme caution and reduced speed.
- If you are not an experienced snow machine operator (and nearly all visitors are considered inexperienced drivers), DO NOT use a sled behind the snow machine. If you need to tow equipment and/or passengers get help from Walter Brower, or Jimmy Ivanoff, ACRF/NSA/AAO Chief Operator.
- The snow machine speed limit for all drivers is 25 mph or less. This is particularly important for towing on icy surfaces, since the sled has a tendency to fishtail on ice or hard pack snow. Note that a sled passenger standing “dog-sled style” at the rear of the sled can minimize fishtailing by dragging a foot in the snow.
- Except under emergency conditions, snow machines are not to carry passengers. Carrying a passenger while towing a sled is particularly hazardous. The sled may hit a passenger falling off the snow machine.

Transportation Hazards – All Terrain Vehicles

- Trained drivers only please – a safety training video and hands-on training is available at the ACRF/NSA/AAO offices. Contact Walter Brower to arrange for training.
- No more than one passenger on the ATV and no passengers in the ATV bed please.
- Drive the ATV on existing roadways and pathways only and not on the delicate tundra. Driving off-road will cause tundra scars which will last for decades.

Cold Weather Hazards

- Be aware of weather conditions and dress appropriately prior to heading for the Great White, the Pumpkin, or other remote work sites. Don't under dress—you never know when you may be required to walk when you planned to ride. Always ensure that someone in your party has a cell phone and spare battery. Keep batteries in an inside pocket during cold weather – cold batteries deliver little or no electrical current.
- Weather conditions (temperature, humidity, wind, and wind chill) can be checked at the Barrow NWS site via the web link, <http://www.wunderground.com/US/AK/Barrow.html>, using the ACRF/NSA/AAO Duplex office and residential computers. The site is book marked as a short cut entitled "Barrow Forecast". The short cut is an Internet Explorer icon and sits along side the Visitor Briefing on the desk top of both computers.
- See the Cold Weather Hazards document at the ACRF/NSA/AAO website under the ES&H Documents heading for additional information.

Animal Predator Hazards

- **Polar Bears**
 - Most of the year and particularly when the ice pack is adjacent to the shore, a polar bear hazard exists in the vicinity of Barrow. Firearms and ammunition are available both at the ACRF/NSA/AAO office and the Great White for use by those who have completed a site-specific firearms training course. It is not required that each work group be in possession of firearms during work activities at remote sites. If you are a visitor and are uncertain about the polar bear hazard, consult with Walter Brower, ACRF/NSA/AAO Barrow Site Facilities Manager, or Jimmy Ivanoff, ACRF/NSA/AAO Barrow Chief Operator. The decision for firearm use or non-use is left with experienced site personnel on a day-by-day basis and will depend on such factors as the perceived threat and planned activities at the site. While working at the site (with or without firearm protection) be continually aware of the threat, and know your route to safety. For extended periods of outdoor work or activity, establish a formal bear watch among your work group. Additional information can be found in the Bear Safety Plan at the ACRF/NSA/AAO web site under the ES&H Documents heading. Remember, if you are a visitor and unfamiliar with the bear threat and not firearms trained, don't make assumptions prior to working at remote sites. Speak to someone like Walter Brower or Jimmy Ivanoff who are knowledgeable about the threat and are firearms trained. Listen to what they tell you and do what they say.

- **Firearm Guidelines**

- Firearms and ammunition are maintained in gun safes at both the Duplex and the Great White. **FIREARMS ARE TO BE USED BY TRAINED PERSONNEL ONLY** and only authorized users have access to these safes. Those persons with current training and authorized by the ACRF/NSA/AAO Site Manager for firearm use are listed at the ARM/NSA/AAO web site http://www.arm.gov/sites/nsa/fsp_auth.stm .
- If your firearm training is out of date (1-year duration) do not check out a firearm.
- If you are under the influence of alcohol or other drugs, do not check out a firearm.
- All firearms and ammunition must be signed out and in. ACRF/NSA/AAO Weapon Activity Log – For Authorized Users Only sheets are located in 3-ring notebooks at both gun safes (Duplex and Great White).
- Ammunition is inventoried so don't lose it. If you do, note the loss when you check the equipment in.
- Firearm practice is encouraged. Check with Mark Ivey, ACRF/NSA/AAO Site Manager, mdivey@sandia.gov , (505) 284-9092, about periodic, organized, firearms training.
- If you find yourself in the situation of having shot a polar bear, call the North Slope Borough Wildlife Management Department (852-0350) and report the incident. Be prepared for considerable reporting requirements in association with the incident.

- **Other Wildlife**

- Foxes are common in the area and rabies is endemic in the fox population. About 50% of the population is infected. Use caution and avoid foxes.
- If an animal bites, scratches, or breaks your skin, seek medical attention immediately.
- Mosquitoes are ubiquitous in the summer season. Cover all exposed skin to avoid bites and later discomfort.

General Work Practices

- If you are a visitor to the ACRF/NSA Site in Barrow, you must coordinate all your work with Walter Brower, ACRF/NSA/AAO Barrow Site Facilities Manager, or Jimmy Ivanoff, ACRF/NSA/AAO Barrow Site Chief Operator. If you are a visitor to the ACRF/NSA Site in Atqasuk, you must coordinate all your work with Doug Whiteman, ACRF/NSA/AAO Atqasuk Operator. If you plan to work at remote sites, you must tell Walter or Jimmy or Doug where you are going, when you are going, and when you expect to return. If Walter and Jimmy are not available in person, you must call one of them on their cell phone to notify them of your plans; Walter (907) 367-3820; Jimmy (907) 367-3824. If Doug is not available in person, you must contact him on the

handheld radio to notify him of your plans.

- During winter months or periods of severe weather, the buddy system is strictly enforced for occasional site visitors. Visitors to the Great White Instrument Shelter in Barrow, the Pumpkin Instrument Shelter in Atqasuk, or other remote sites must be accompanied by regular site personnel—*no exceptions*. An alternate buddy system may be used by personnel who visit the site regularly and can comply with the requirements of the alternate buddy system.
- Routine site workers may occasionally encounter the need to travel to remote sites and work alone. This practice should be infrequent and should be considered carefully, particularly during severe winter weather. See the ACRF/NSA/AAO Alternate Buddy System policy which can be found in the ACRF/NSA/AAO ES&H Documents binder located in the Duplex and the ARC House or at the ACRF/NSA/AAO website under the ES&H Documents heading for more information.
- If you absolutely must go to the site alone, you must notify a fellow worker of your time of departure and your expected time of return. If there is no one in the Duplex to notify, you must call Walter at (907) 367-3820, or Jimmy at (907) 367-3824, to notify one of them. If there is no one in the Atqasuk ARC House to notify, you must call Doug on the portable handheld radio and sign out in the Sign Out Log at the ARC House. ***These are important rules – failure to follow them may result in disciplinary action.***
- Any work party going to the Great White Instrument Shelter must be equipped with a cellular phone and a spare battery. The phone and battery should be kept warm in an inside pocket. Any work party going to the Pumpkin Instrument Shelter must be equipped with a portable handheld radio. Use of the handheld radio and frequency to use must be discussed with Doug Whiteman prior to going to the Pumpkin Instrument Shelter alone. Emergency notification numbers should be carried along with a phone and the handheld radio. Emergency Barrow numbers are printed on a card which can be obtained from Walter or Jimmy. Emergency Atqasuk numbers are printed on a Visitor Guide handout which can be obtained from Doug. You may also dial 911 for local emergency response.
- Keep the working surfaces at the Great White clear of snow and ice. Always exercise caution on walking and working surfaces that may be ice or snow covered.

Equipment Exposure Hazards at the Great White

- **Electrical Hazards**
 - Electrical safety is a top priority. You must follow the electrical safety rules of your home lab or sponsoring institution. If you are uncertain about an electrical safety issue, ask one of the Site staff, the Site Manager or Site Operations Manager. Physically disconnect (pull the plug) on main AC power connections to instruments prior to working on them. When troubleshooting an open instrument with power applied, exercise extreme caution when working and probing inside the instrument.
- **Circuit Breakers**
 - The operation or resetting of circuit breakers is an electrical safety concern. You must follow the rules specified by your home lab or sponsoring institution regarding circuit breaker operation. Circuit breakers are NOT designed as disconnect switches under load, unless labeled as such. Make sure all loads are turned off as much as possible to reduce or eliminate loads on circuit breakers before turning any breaker off. Always make sure to stand off to the side of a breaker when turning it on or off, in case failure might occur, to reduce injury possibilities, particularly to the face or torso.
- **Noise Hazards**
 - The RASS unit emits a loud warble during atmospheric sounding for 10 minutes every hour. Under normal site operations and conditions, exposure to this noise will not be hazardous to your hearing and hearing protection is not required. The audio amplifier circuit should be disabled before working on the sound sources since exposure at close range can damage your hearing.
- **EMF Hazards**
 - The mm Cloud Radar and the 915 MHz Radar Wind Profiler emit energy in the vertical direction at microwave frequencies. Under normal working conditions, microwave exposure hazards are insignificant for persons working at the site. Do not extend any part of your body over the Cloud Radar or Wind Profiler antenna while these instruments are in operation.
- **Cryogenic Hazards**
 - During certain instances, some instruments may be onsite that require liquid nitrogen for various detectors. Persons handling cryogenic fluids must be equipped with a face shield and insulating gloves.
- **Optical Hazards**
 - Several instrument systems (the ceilometer and micro-pulsed lidar) incorporate pulsed laser sources. These systems both use Class I (eye safe) lasers and do not pose an exposure hazard to the unaided eye. Binoculars or other optical devices should not be used to view the exiting beam however, since they may focus

hazardous levels of laser light into your eye.

- **Pressurized Gas Hazards**

- Insure that all compressed gas cylinders are secured to a wall or rigid frame in an upright position with straps or chains. When a cylinder is not in use, screw the protective steel cap over the cylinder valve. When transporting cylinders, insure that they are securely tied down to the transporting vehicle or sled and that valve caps are in place. Remember that an unsecured gas cylinder, which is punctured or has a severed valve fitting, is an uncontrolled rocket and you may find yourself in its path.

- **Meteorological Tower Hazards**

- Do not climb the meteorological tower at the site under any circumstances. Tower inspections and maintenance of tower sensors that necessitates climbing the tower will be carried out by professional tower service personnel only. Tip Tower lowering and maintenance should normally be done in cooperation with regular site workers. If Tip Tower maintenance or lowering is required, it must be done using the ACRF/NSA/AAO Tip Tower Lowering procedure which can be found in the ACRF/NSA/AAO ES&H Documents binder located in the Duplex and the ARC House or at the ACRF/NSA/AAO website under the ES&H Documents heading.

Other Miscellaneous Hazards and Guidance

- **Chemicals**

- As a general reminder, if you are bringing chemicals to the ACRF/NSA/AAO facilities, please list the chemicals on your Site Access Request form, IOP Questionnaire form, or ACRF/NSA/AAO Shipment Notification form. Please provide the ACRF/NSA/AAO Site Manager, Mark Ivey, mdivey@sandia.gov, with a Material Safety Data Sheet for each chemical you bring to the NSA. Arrangements must also be made for proper storage (e.g. flammable liquids placed in a flammable storage cabinet). All chemicals should be kept in their original labeled containers. Please also be aware that any person or organization bringing chemicals to NSA facilities is responsible for the removal or proper disposal of those chemicals unless prior arrangements are made with the ACRF/NSA/AAO Site Manager.

- **Emergency Exit from the Great White**

- An emergency exit is located in the Great White opposite the main entrance. This exit may be used in case of fire or another need to rapidly exit the facility. Be aware that an approximate 6-foot drop exists between the emergency exit door threshold and ground. An external ladder is fixed below the door threshold to aid in evacuation.

- **ACRF/NSA Duplex Fire Hazards and Emergency Exit**
 - The Duplex living and office quarters are equipped with smoke alarms and a total of four fire extinguishers. The fire extinguishers are located in the building entrance, the boiler room, Ops. Office, and on the residential side between the living room and the kitchen., Bedroom and office windows may be your escape routes in the event of a fire so insure that they are operable when you begin using a room. In the case of an emergency evacuation, remember that weather conditions may be severe and that you should take outdoor clothing with you. You can also seek immediate shelter in the main NARL building, which is located about one city block from the ACRF/NSA Duplex. This building is open 24 hours a day.
- **ACRF/NSA Duplex Electrical Hazards**
 - If for some reason, electrical power must be shut off to Duplex circuits, a breaker box is located in the utility room which is accessed from the duplex entry way.
- **ACRF/NSA Duplex Living**
 - There are a number of household rules that apply to visiting, staying, and living in the Duplex. Some of the rules are posted at the entrance to the Duplex, and others are listed in the ACRF/NSA/AAO Duplex Rules which can be found in the ACRF/NSA/AAO ES&H Documents binder located in the Duplex and the ARC House or at the ACRF/NSA/AAO website under the ES&H Documents heading. Familiarize yourself with these rules to make your stay go smoothly.
- **Emergency Response Plan**
 - The ACRF/NSA/AAO Emergency Response Plan covers extreme weather events and other emergencies and is provided in the ES&H documentation which can be found in the ACRF/NSA/AAO ES&H Documents binder located in the Duplex and the ARC House or at the ACRF/NSA/AAO website under the ES&H Documents heading. Please read this plan before beginning work at the site so that you are familiar with recommended or required actions in the event of fire, storm surge flooding, blizzard, medical emergencies, and power outages.
- **ES&H Policies for Intensive Operating Periods**
 - The ARM Program has prepared an ES&H Policy statement that provides guidance for operations related to Intensive Operating Periods. If your work at the NSA is related to an IOP, please review this policy which can be found in the ACRF/NSA/AAO ES&H Documents binder located in the Duplex and the ARC House or at the ACRF/NSA/AAO website under the ES&H Documents heading.

Accident Reporting

If you are injured or involved in an accident while working at the site, you must report the accident through your employer and you must notify the Site Manager as well. For example, if you are a PNNL employee you must report the accident through PNNL channels following

PNNL procedures. If you are a visiting scientist, you would report the accident through the laboratory or agency that is funding you. You are also required to notify Mark Ivey, ACRF/NSA/AAO Site Manager. If you are a Sandian, Sandia contractor, or subcontractor, you and the Site Manager must report the accident using Sandia National Laboratories form SF 2050-P # (12-2000) Supersedes (7-96) Issue, which is available at the ACRF/NSA/AAO web site under the ES&H Documents link. Lessons learned from such occurrences will be used to minimize future occurrences.

When any accident occurs at the ACRF/NSA/AAO Site involving ARM project personnel or contractors that has the potential for having caused significant bodily harm, whether such harm is apparent or not, medical checkout through local medical services is mandatory and not optional. This policy applies to Sandians, Sandia contractors and subcontractors.

**ENJOY YOUR STAY AT THE ACRF/NSA/AAO Site
AND WORK SAFELY**