The National Science Foundation
Office of Polar Programs
Polar Environment, Safety & Health

SOH-POL_2000.10
NSF Office of Polar Programs Safety and Occupational Health Policy

Organizational Function	Polar, Safety & Health	**Policy Number**	SOH-POL_2000.10
Version	5	**Issue Date**	Date of signing
Policy Category	Safety	**Effective Date**	Date of signing
		Review on	As needed and/or every two years
Subject	Safety and Occupational Health	**Authorized By**	Director, Office of Polar Programs
Office of Primary Responsibility	National Science Foundation Geosciences Directorate Office of Polar Programs Polar Environment, Safety & Health	**Responsible Official**	NSF OPP Safety and Occupational Health Officer
Address	2415 Eisenhower Ave. Alexandria, VA 22314	**Phone** **Fax** **Web**	703.292.8030 703.292.9080 www.nsf.gov
Distribution	NSF OPP All	**Status**	Policy
Online Publication			

Document Release History

Release Number	Revision Date	Description of Changes	Changes Made By
1	June 2017	Initial Version	J. Fentress
2	July 2018	Multiple edits to multiple sections	J. Fentress
3	August 2019	Multiple edits to multiple sections	J. Fentress
4	September 2021	Multiple edits to multiple sections	C. Nelson
5	September 2022	Multiple edits to multiple sections	C. Nelson

Signature Approval

Singed copy on file. _____ _____
Jon M. Fentress Date
NSF OPP Safety and Occupational Health Officer

Singed copy on file. _____ _____
Dr. Roberta Marinelli Date
Director, Office of Polar Programs

Note This policy becomes effective on the date of signing.

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Overview

1. Purpose and Objective

1.1 The purpose of this policy is to establish a comprehensive accident and illness prevention program for the National Science Foundation's Office of Polar Programs (OPP), which supports research in some of the most hazardous environments on Earth, both in the Arctic and Antarctic regions. Information in the various sections of this policy provides safety expectations and guidance for specific activities common to OPP operations and research support.

1.2. This document provides the ***minimum*** safety standards that OPP expects to protect all program participants from hazards and assists in mitigating program risk to an acceptable achievable level, allowing for the successful completion of science in the polar areas.

1.3. The specific objectives of this policy and its sections are:

- **S**afe performance of activities supported by OPP.
- **A**ppropriate safety standards for all engineering, construction, operating, administrative, research, and maintenance activities.
- **F**acilities and projects that provide an inherently safe environment.
- **E**nsure a proactive safety climate where risk management is something we all live together and not merely something assigned to a few individuals.

2. Applicability and Compliance

2.1. This policy and the procedures prescribed in the supporting sections apply to all program participants, grantees (investigators and students), contractors, federal employees, military personnel, and official visitors working at or visiting a USAP facility, an NSF-managed Arctic station, field camps, ships, or aircraft.

2.2. The revisions of this policy supersede all proceeding OPP Safety policy and guidance. Station management, contractors, and research partners shall develop supplemental guidance and standard operating procedures (SOPs) as prescribed in federal, state, or local statutes and this policy. It will be reviewed at an interval of not more than two years unless serious incidents or trends not currently identified require additional information and policy revision.

2.3. Distribution should be to all OPP stakeholders.

3. General Safety Policy

It is the policy of OPP that all program participants take proactive safety measures so that science and science support are performed in safe working conditions.

- All participants are required to comply with all applicable OPP safety requirements, including those in the contractor's site-specific accident prevention plan. Program participants should perform their duties in a safe manner, comply with all processes and procedures, and are empowered to make safety recommendations or bring safety risks to the attention of senior leaders.

- Grantees are bound by NSF's grant terms and conditions and as such are responsible for the conduct of the research under their award. While being supported by the Office of Polar Programs, researchers will comply with all contractor and research station policies, procedures, training requirements and other safety measures.
- Individuals will ensure they have required safety and occupational health (SOH) training, review and follow Job Hazard Analyses (JHAs), and utilize personal protective equipment (PPE) as required for specific tasks.
- Safety and Occupational Health considerations will be integrated into the development of all OPP research and project plans. All stakeholders will ensure that a risk assessment is performed for the research activities and projects for which they have authority and/or responsibility.

4. General Responsibilities for Program Participants

4.1. Management and Leadership will implement the risk management process in support of all program activities. They will track and report safety trends, and work to constantly improve work conditions for all program participants.

4.2. Supervisors are responsible for the safe conduct of all work under their control. They shall be familiar with all recognized codes, standards, and regulations relevant to their work and ensure that such requirements are strictly enforced. These include all applicable OSHA standards and applicable host nation requirements. Supervisors will ensure all employees receive a safety orientation that covers hazards in the work environment and other essential safety information.

4.3. Station management shall provide a safety in-brief to all visitors (including Distinguished Visitors) and researchers. The names of attendees and the topics covered at this briefing shall be documented.

4.4. All program participants are responsible for participating in safety briefings and trainings and to report any unsafe conditions or conduct to ensure their safety and the safety of others.

5. Accident Prevention

Accident prevention measures must be integrated into all activities and operational procedures supported by OPP.

6. Risk Management

6.1. Composite risk management (CRM) shall be integrated into implementing OPP-funded research. The five basic steps of CRM are: (1) identify the hazard, (2) assess the hazards to determine risks, (3) develop risk-mitigating controls, (4) implement the controls to eliminate or reduce the hazards, and (5) supervise the implementation of controls and evaluate their effectiveness.

6.2. All research plans, specifications, designs, technical publications, and operating procedures will be reviewed for conformance with established safety codes and standards. The NSF OPP Occupational Health and Safety Officer will provide review assistance and is the final authority in determining compliance with SOH requirements and other applicable codes. For any research activity or project

that is found to have a medium to high risk, based on the probability of a safety incident occurring and the severity of loss if one does occur, a safety professional must be consulted to ensure risk is mitigated to acceptable levels and that an accident prevention plan is developed and implemented. This accident prevention plan shall be documented and available for OPP review.

7. Occupational Safety and Health (OSH) Act Standards

7.1. Although the Occupational Safety and Health Administration (OSHA) does not have jurisdiction extra-territorially, OPP requires compliance with OSHA standards, as well as with NFPA (National Fire Protection Association) standards, local standards, the NEC (National Electric Code), and the IBC (International Building Code), among others. New construction engineering and existing facilities engineering shall comply with the latest version of the IBC.

7.2. The OSH Act is applicable to all OPP employees and will be complied with in applicable workplaces. Executive Order 12196, Occupational Safety and Health Programs for Federal Employees, makes each Federal agency head responsible for establishing and maintaining an effective and comprehensive Occupational Safety and Health Program. The rights and responsibilities of employees, as delineated in Title 29 CFR, Part 1960, Federal Employee Safety and Occupational Health, will be implemented.

7.3. At times, it is not feasible to comply with a specific OSH requirement, due to conflicting circumstances, practices, laws, regulations, or other limitations. In that case a waiver/variance request shall be made to the OPP Safety Officer using form PESH-FORM_2000.10-4 (see Appendix E). Work should not proceed without resolving the request with the OPP Safety Officer or designee.

8. Safety Surveys and Inspections

8.1. At a minimum, all operational areas at a research station (and other locations, when possible) shall be surveyed and inspected two or three times a week by someone with knowledge of the safety requirements/standards associated for potential safety hazards. These safety inspections should occur daily during operations and maintenance (O&M) and construction work. All findings not in compliance with safety requirements, codes, and standards shall be identified, tracked, prioritized, and corrected as soon as possible.

8.2. There shall be a central location where all safety related permits, AHAs/JHAs, Accident Prevention Plans or other risk documents are stored near where significant activities are being performed.

9. Suspending Operations

It is the policy of OPP that anybody who observes an activity or operation that poses a risk to safety of personnel or equipment can temporarily stop that activity until whoever is the senior responsible person is notified and reinitiates the activity. This can be a contractor to contractor, contractor to grantee, grantee to contractor, or any other possible combination.

10. Organizational Responsibilities

10.1. OPP Safety Responsibilities and Authorities

10.1.1. OPP Director

- The Director has delegated responsibility for establishing SOH policy to the NSF OPP Safety and Occupational Health Officer (OPP Safety Officer). The OPP Safety Officer is also responsible for safety and occupational health issues requiring specific actions, interpretations, or directives.

10.1.2. Contracting Officer Representatives (COR)

- The COR is designated by the CO (Contracting Officer) to develop contract tasking and manage contractor performance within a CO-approved annual program plan, which includes any relevant safety and health requirements or standards. Due to the size and complexity of the support contracts in OPP, the COR authorizes Activity Based Managers (ABMs) to manage tasking and expenditures against the approved annual program plan.

10.1.3. NSF OPP Safety and Occupational Health Officer

- The OPP Safety Officer reports to the Director. Therefore, the OPP Safety Officer is independent of the Antarctic or Arctic programs and focused on risk mitigation.
- The OPP Safety Officer has the authority to intervene in all safety and health activities and, where feasible (and within funding constraints), should also have access to all sites, research stations, and contractor safety personnel.
- Duties include:
    - Develops safety and occupational health policy;
    - Develops or reviews specific procedures to protect personnel, property, and the environment;
    - Ensures that contractor safety and health requirements, standards, best business practices, and this policy are being complied with across all OPP-supported activities and sites;
    - Tracks accident trends across OPP activities and shares lessons-learned to prevent similar future incidents;
    - Makes determinations on waivers and variances to SOH requirements and standards;
    - Ensures proper investigation of all recordable accidents and ensures that corrective actions are implemented; and
    - Performs risk analysis and provides risk-mitigation recommendations on SOH matters, as needed.

10.1.4. OPP Activity Based and Program Managers

- Ensure they are familiar with the safety and occupational health requirements within their programs and ensure proper risk mitigation;
- ensure that safety and health planning activities, such as design reviews, specification development, operations, maintenance, and research support are reviewed for compliance with safety and health requirements;
- Request support from the OPP Safety Officer as needed to perform their work;
- Ensure designers use methods and techniques that prevent or reduce hazards associated with use of proposed equipment, processes, or facilities; and
- Act immediately, in consultation with the OPP Safety Officer, when SOH non-compliance is identified to ensure corrections are made to prevent injury or property damage; for immediate-danger-to-life-and-health (IDLH) items, work and/or research must be stopped until these can be corrected.

10.2. Contractor Safety Responsibilities and Authorities

10.2.1. Prime Contractor's Leadership

- Safety starts with senior contractor leadership. It should be clear to OPP that senior leadership for the prime contractor supports and values the OPP Safety Policy described in this document through behaviors, decisions, and actions. Contract leadership shall:
- Ensure compliance with 29 CFR 1910, 1926, the National Fire Protection Association (NFPA), the National Electrical Code (NEC), and the International Building Code (IBC) (2015), among other U.S. standards, during all operations and activities under their control and authority;
- Ensure the organization has an established and documented safety and health program that emphasizes proactive safety measures, and that has a clearly evident process for accountability;
- Ensure the contractor safety office is staffed appropriately to meet OPP mission support requirements, as identified by OPP; and
- Ensure that supervisors know their safety responsibilities and have supervisory safety training as needed to be successful;
- Recognize exceptional safety performance by teams in the field, thus fostering a safety culture in which hazards are reported openly and employees protect one another.

10.2.2. Contractor's Safety and Health Staff

The prime contractor shall ensure all subcontractors comply with this policy. The prime contractor is responsible for each subcontractor's safety performance. The prime contractor's safety and health team shall:

- Have the training, education, and experience needed to ensure the broad range of safety oversight necessary to provide the required safety oversight and ensure risk mitigation.
- Enforce this policy and the safety standards and processes within;
- Ensure continuing inspection of job sites for compliance with contractual requirements;
- Ensure work meets the requirements of the Code of Federal Regulations (CFR) 1910 and 1926 or other SOH standards and requirements, where applicable;
- Develop and submit accident prevention plans and activity hazard analyses for all O&M and construction projects before physical work begins, to include fatigue management;
- Submit accident prevention plans and activity hazard analyses to the OPP Safety Officer for review and acceptance when risk assessment code (RAC) for an operational or research project is medium or high, as identified during the risk management process;
- Provide preliminary accident notification information to the OPP Safety Officer within 24 hours
- Provide a complete investigation to the OPP Safety Officer within 30 days for all recordable accidents or injuries;
- Ensure action is taken to prevent a recurrence;
- Ensure work groups hold safety meetings at appropriate frequency (daily or weekly) to inform all workers of planned work and its hazards;
- Require field personnel to include all safety findings in reports, whether negative or positive, and track them in a log;
- Ensure all accidents are investigated and corrections identified and implemented in a timely matter;

- Keep OPP advised about safety findings and make recommendations for changes or improvements where conditions warrant;
- Ensure that adequate fire prevention and protection programs, as well as emergency response plans, are established for all sites and that exercises and drills are performed and documented as required;
- Ensure personnel receive relevant safety training on a regular basis, or as required by the Code of Federal Regulations, specifically 1910 and 1926;
- Provide safety briefings for visitors, to include distinguished visitors (DVs);
- Ensure all new field personnel receive a safety orientation at their work center;
- Ensure all employees with potential exposure to noise levels exceeding OSHA's time-weighted average of 85dba (29 CFR 1910.95) or exposure to hazardous chemicals or toxic wastes (29 CFR 1910 Subpart Z) are placed in a medical surveillance program to ensure their safety and health;
- Provide the necessary PPE for each employee and ensure training is provided on its proper use;
- Evaluate safety performance and develop a programmatic reward system between subcontractors;
- Ensure new designs and station plans prevent or reduce hazards associated with operation, maintenance, and use by personnel; and
- Ensure direct SOH oversight for any high-risk activities (see list in Section 3).

Section 1: Physical Qualification Policy

1. Purpose

The purpose of this document is to establish National Science Foundation Office of Polar Programs (NSF/OPP) administrative policy regarding physical qualification (PQ) determinations in the NSF Arctic Program and the U.S. Antarctic Program (USAP). NSF/OPP, as delegated manager of the USAP, requires that all candidates for deployment to Antarctica under the auspices of the USAP undergo and pass a PQ process. NSF-funded researchers and support personnel traveling to certain remote parts of the Arctic must also undergo and pass the PQ process.

The PQ process is designed to identify personnel who are physically qualified and, for some winter-over candidates, psychologically adapted for assignment in the polar regions. The PQ process is necessary to identify the presence of any physical or psychological condition that would threaten the health or safety of the candidate or other program participants and that could not be effectively treated by the limited medical care capabilities in Antarctica and the Arctic, or that otherwise poses a risk that would jeopardize accomplishment of OPP objectives. The total risk entails not only the medical condition of the participant but also the length of exposure during which a disease process could manifest.

Also important during any season, summer, or winter, are the costs of lost productivity and the diversion of limited resources that result when deployed personnel are unable to perform their assigned function. For these reasons, all participant medical documentation is reviewed against a rigorous set of medical clearance criteria—the Polar Medical Screening Guidelines—that were established and are regularly reviewed by qualified medical personnel. The physical qualification process is outlined at 45 CFR 675.

2. Applicability and Compliance

This policy applies to all Antarctic personnel - governmental, military, grantee, contractor, and distinguished visitors - proposed for deployment to USAP stations and vessels south of 60° south latitude.

This policy also applies to personnel deploying to certain Arctic locations in Greenland, as described below. Other locations or circumstances may be identified by the OPP Arctic Sciences section head and the OPP senior advisor for Polar Medical Programs.

- **Kangerlussuaq**. No one deploying to Kangerlussuaq is required to PQ. However, the contractor may reassign certain of its employees to other remote locations in Greenland (e.g., Summit, remote field camps) and therefore may choose to require that these individuals physically qualify. These individuals will be identified by the Arctic contractor to CU-Polar Medicine (University of Colorado Anschutz Medical Campus).

- **Remote Field Camps**. Everyone deploying to a remote field camp for 30 days or more is required to physically qualify. These individuals will be identified by the Arctic contractor to CU- Polar Medicine.

- **Summit Station**. Everyone deploying to Summit Station for any period of time outside of a 109th flight period (the time a 109th aircraft is in theater) must physically qualify. These individuals will be identified by the Arctic contractor to CU-Polar Medicine.

3. PQ Policy

3.1. PQ Standard

The basic standard to be met is specified in the current version of the Polar Medical Screening Guidelines. The guidelines are annually reviewed and revised as need to reflect both currently accepted medical practice and the medical resources in place at various operating locations. It is not OPP's intent to have a fully catalogued, yes/no approach to the physical qualification process. Therefore, OPP expects that individuals will be PQ'd or NPQ'd (determined "physically qualified" or "not physically qualified") according to these guidelines and medical judgment.

Generally, risks to the individual will be balanced against the risk to the program. Only individuals who can reasonably be expected to fulfill their intended roles without adverse medical risk to themselves or others and without inordinate consumption of medical resources should be deemed physically qualified to deploy. It is therefore imperative that due weight to overall health and risks are thoughtfully considered for each individual. An individual will be determined to be PQ'd if all applicable medical, dental, and mental health screening requirements are met. For those found to be NPQ'd, a waiver process allows for peer review of NPQ decisions, see Enclosures 1-5 for Waiver Process flowcharts.

Employers should ensure they are proposing skilled personnel who meet fitness-for-duty standards. It is not the purpose of the PQ process to provide that assurance or fit-for-duty certifications.

3.2. PQ Process

The PQ process thoroughly reviews a candidate's health. Employers should encourage candidates to begin the process as soon as they become aware they will be deploying. Candidates are required to submit their completed forms, along with the results of tests, no later than eight weeks after receiving the PQ packet from University of Texas Medical Branch (UTMB), CU-Polar Medicine, or the designated OPP Safety and Occupational Health Manager. PQ determinations will be issued within eight weeks of receipt of all required tests and examinations.

Travel will not be authorized until the PQ process is complete. It is therefore in the candidate's interest to comply with these timelines to allow sufficient time for the initial and, in some cases, additional review. For example, depending on a candidate's medical condition, additional testing or a waiver may be required, which could add time to the process.

NOTE: If a participant's previous PQ package expires within 8 weeks of deployment, the participant will be required to provide a new PQ package. See paragraph 4.3 PQ Duration.

3.3. Infectious Disease Prevention

The PQ Determination Policy concerning immunizations primarily follows the recommendations of the Center for Disease Control and Prevention (CDC) and the Advisory Committee on Immunization Practices (ACIP). Any immunizing agent licensed by the Food and Drug Administration (FDA) or the

Department of Health and Human Services (DHHS) may be used, as well as emergency use authorization (EUA) process.

Screening for immunity. For some vaccine–preventable diseases, serologic or other tests can be used to identify preexisting immunity from prior infection or immunization that may eliminate the need for unnecessary immunization. Such testing may be adopted where it offers advantages in terms of improved care or medical economics.

Candidates of deployment reduce the personal risk of infection and reduce the spread of vaccine-preventable infections by receiving appropriate vaccines. Required immunization is based on relative likelihood of the various microbial threats and the existence of any vaccine– vaccine, vaccine–antibody, or vaccine–drug interactions. A starting point for prioritizing immunizations for an individual would consider microbes most likely to be encountered (for example, SARS-CoV-2, hepatitis A, influenza), of greatest severity if encountered (for example, rabies), or of long–standing risk (for example, hepatitis B, tetanus–diphtheria– pertussis, poliovirus, varicella, measles–mumps–rubella (MMR)). Required immunizations are identified in the Polar Medical Screening Guidelines. The requirements are based on CDC recommendations, host country requirements and OPP's Medical Review Panel. Candidates will be provided requirements in the PQ packet.

3.4. Medical Suitability Assessments

The PQ process is designed to identify personnel who are physically qualified and, additionally for some winter-over candidates, psychologically adapted for assignment in the polar regions. The PQ process is necessary to identify the presence of any physical or psychological condition that would threaten the health or safety of the candidate or of others, that could not be effectively treated by the limited medical care capabilities in Antarctica and the Arctic, or that otherwise pose a risk that would jeopardize accomplishment of OPP objectives. Also important during any season, summer or winter, are the costs of lost productivity and the diversion of limited resources that results when deployed personnel are unable to perform their assigned function. The following processes have been implemented and/or revised to replace the previous psychological assessments:

3.5. PQ Screening

The medical subcontractor will review all mental health information. Criteria has been developed to determine when a participant will need further evaluation by a mental health professional. The results of the evaluation are to be considered in making a holistic PQ determination.

3.6. Background Checks

Background checks are completed on every participant that will deploy. NOAA personnel who spend the winter at South Pole are Federal employees and as such they also undergo background checks. OPP expects background checks will continue to be completed for all South Pole winter-over candidates.

3.7. Team Building

Nearly every South Pole winter-over candidate, contractor and grantee attends team building. Although OPP greatly prefers that all candidates participate in the pre-deployment exercises as a group—contractor employees and grantees—it is recognized that this may not always be possible. Some individuals may have pre-existing commitments that make attendance impossible; some number

of South Pole winter-over participants will be drawn from McMurdo or South Pole summer employees, making their attendance at U.S.-based training impractical.

3.8. Metrics

The contractor will at minimum track and report on the following:

- For behaviors noticed during the hiring and team building processes, accommodations made for the hire and a post-season discussion of outcomes
- For summer participants who transition to winter-over positions at the South Pole, evidence that current supervisors were consulted and performance evaluations were reviewed and, for any noted concerns, a post-season discussion of outcomes
- For mental health referrals, number ordered with reasons
- For mental health waivers, number approved and number denied, with reasons for each

3.9. Approved PQ Examiners

Examinations and tests shall be performed in the U.S. by a physician (MD/DO) or licensed mid-level practitioner (NP/PA).

3.10. Exceptions

3.10.1. Candidates who convert from a summer position to a South Pole winter- over position will be transported off-Ice for the required mammogram and exercise stress test. All remaining examinations and tests will be conducted at the station clinic. Any deviation from this requirement requires the approval of the Polar Medical Programs Senior Advisor.

3.10.2. Seasonal contractor employees with accepted offers of employment prior to leaving the Ice may complete the PQ examinations and tests in New Zealand or Chile. NSF will not accept the risk of an incorrect or incomplete translation and therefore submissions in languages other than English must be accompanied by a certified translation.

3.10.3. U.S. citizens whose permanent address is other than in the U.S. shall consult with UTMB/UC-Polar Medicine to determine whether they may complete their PQ tests and exams outside of the U.S.

3.10.4. Non-U.S. citizens from countries with which OPP does not have a reciprocal agreement (see Paragraph 5.4.) or who cannot PQ through their national program should contact UTMB/UC-Polar Medicine to discuss options for completing the required examinations and tests.

3.11. Financial Responsibility

OPP shall pay for the initial examinations and tests required by the standard PQ process. Most payments are made in the form of reimbursements from the prime contractor to participants or, in the case of LabCorp, direct payments from the prime contractor to the vendor. Additional tests, such as those that may be required to submit a waiver application, are the responsibility of the individual and will not be reimbursed by the government.

OPP grants include funds for the cost of initial examinations and tests. Grantees from other federal agencies are responsible for paying all costs associated with the PQ process.

3.12. Decision Responsibility

Three organizations are authorized by OPP to issue PQ determinations, depending on the participant's affiliation. See Enclosures **6-7 for PQ Determination flowcharts.**

3.13. UTMB
UTMB conducts the screening review and makes PQ determinations for the vast majority of Antarctic personnel and Intergovernmental Personnel Act (IPA) personnel assigned to OPP.

3.14. UC-Polar Medicine
UC- Polar Medicine conducts the screening review and makes PQ determinations for the vast majority of Arctic personnel required to undergo the PQ process.

3.15. Polar Medical Programs
The Polar Medical Program will conduct screening reviews of all NSF personnel and distinguished visitors. The OPP Chief Medical Advisor will provide a recommendation to the Polar Medical Programs Senior Advisor whom will provide the final determination.

NOTE: The NSF Health Unit conducts the screening tests and examinations for NSF employees and IPA personnel, and distinguished visitors. IPA personnel assigned to OPP may complete screening tests and examinations at the NSF Health Unit, but UTMB makes the PQ determination for these individuals. For NSF employees, the NSF Health Unit provides PQ packages to the Polar Medical Program for final determination. It is the responsibility of the participant to ensure that the complete package is received by Polar Medical Program Manager.

3.16. Pacific Air Forces/Surgeon General (PACAF/SG)
Military members deploying to McMurdo Station, Antarctica, including Department of Defense distinguished visitors, are required to be physically qualified for mobility assignment in accordance with AFI 48-123 Medical Examination and Standards: Deployment Criteria. (This is an Air Force Instruction; other services should refer to their version.) The member's unit will be responsible for medical screening and the PACAF/SG has final disposition authority for deployment with Joint Task Force – Support Forces Antarctica.

3.17. Medical Records (USAP Only)
3.17.1. The medical clinic at the station to which a participant is deploying must have a copy of the participant's medical record before the participant arrives. For the vessels, the records shall be sent to the Palmer Station clinic.

3.17.2. UTMB shall follow the ASC Medical File Data Transfer Procedure (MED-SOP- 0004) to send medical records via Secure File Transfer Protocol (SFTP). Arctic PQ records are not generally sent except in the case of complicated medical histories or waivers. If necessary, the ASC Medical Director shall discuss participant medical issues with the contracted medical provider for the Arctic.

3.17.3. Polar Medical Program Manager will send medical records via Secure File Transfer Protocol (SFTP).

3.17.4. Polar Medical Program Manager shall send medical records for distinguished visitors via SFTP to the applicable clinic.

4. Constraints and Conditions

4.1. PQ Examination Time Limit

Tests and examinations used in reaching the PQ determination may not be more than six months old. OPP will not reimburse for the cost of tests and examinations that must be repeated due to the expiration of results

4.2. Medical or Health Changes

Individual participants are required to inform contractor medical staff of all medical or health changes, including changes in medication, that occur after submitting the PQ documentation and/or following receipt of a PQ determination. NSF staff shall notify OPP's Chief Medical Advisor.

4.3. PQ Duration

PQ determinations are valid for 12 months from the date of issue, or until the participant departs from the Arctic or Antarctic. For individuals deploying under an approved waiver, the PQ determination will be valid for 12 months from the date of the NPQ determination. Participants are deemed to have departed the Arctic or Antarctic when:

- They physically depart;
- They reach the maximum allowable continuous deployment period of 450 days for the Antarctic (see AIL-POL_1000.04) and eight months for the Arctic (after this time, the PQ process must be repeated); or
- They are transported from their primary assigned work location for medical treatment or evaluation.

4.4. Multiple Deployments

Participants who are physically qualified to deploy, whether under the auspices of the USAP or the NSF Arctic Program, may make multiple deployments to the Arctic or Antarctic or between the Arctic and the Antarctic within the 12-month effective period of the PQ determination.

4.5. Deployment After Medical Transport

4.5.1. When participants are transported to New Zealand, Australia, South America, Greenland, or the continental U.S. for psychological reasons, they must repeat the PQ process before they are authorized to deploy again.

4.5.2. When participants are transported to New Zealand, Australia, South America, Greenland, or the continental U.S. for medical or dental reasons, the ASC medical director will consult, as necessary, with the OPP Chief Medical Advisor clinic staff, and others as necessary to make a determination, consistent with the Polar Medical Screening Guidelines, as to whether the participant:

- May deploy again;
- May deploy again following successful completion of certain portions of the PQ tests and examinations; or
- Is NPQ. In some circumstances, a participant determined to be NPQ may request a waiver.

4.5.3. When participants are transported from South Pole, a remote field camp, or a vessel to McMurdo Station or Palmer Station, or from certain Arctic locations for any medical or dental reason, the ASC medical director will consult, as necessary, with the OPP Chief Medical Advisor, clinic staff, and others as necessary to make a determination, consistent with the Polar Medical Screening Guidelines, as to whether the participant:

- May return without restriction to his or her primary assigned work location;
- May return following successful completion of certain portions of the PQ tests and examinations; or
- Is NPQ. Depending on the circumstances, a participant determined to be NPQ may be able to request a waiver.

4.5.4. Recognizing that there may be medical as well as non-medical risks involved in the above-mentioned participants returning to the Arctic or to Antarctica, the senior advisor for Polar Medical Programs will review each case and determine whether the participant will be authorized to return.

4.5.5. OPP will not reimburse for the cost of any treatment or evaluation received away from the Arctic or Antarctic or of any tests and examinations that must be repeated to determine whether the participant may deploy again.

5. Exceptions

5.1. Short-Duration Deployment PQ

5.1.1. Eligibility

Candidates are eligible to apply for the short-duration deployment PQ process if:

- The PQ process is conducted by UTMB/NSF;
- Deployment is anticipated for 14 days or less;
- The individuals are not deploying under active awards; and
- The individuals are not expected to engage in strenuous labor.

5.1.2. Process

The process for reviewing candidates deemed eligible for the short-duration deployment PQ process takes into account that these candidates are likely to represent a low risk for adverse medical outcomes during the period of their deployment and therefore may be adequately screened by a review of their medical history, vision information, and self-assessment. Candidates must demonstrate normal height/weight characteristics and the absence of chronic disease for which there is no on-site treatment capability.

Candidates shall be reviewed against the existing medical clearance criteria. UTMB may use its judgment to determine that a candidate should instead undergo the full PQ process. Candidates judged NPQ under the expedited process must undergo the standard PQ process before they are eligible to submit a waiver application.

Approval under this exception is strictly for a single deployment of 14 days or fewer, and candidates will not be authorized to redeploy without completing either the short- duration deployment process again or the standard PQ process.

5.2. Two-Year PQ Program

5.2.1. Eligibility

Candidates 45 years of age and younger are allowed to undergo the full PQ process only every other year. In other words, when you PQ in one year, your PQ determination will be effective for the following year. However, if you intend to deploy to the South Pole for the winter-over period during your second year, you must repeat the full PQ process.

5.2.2. Process

1. All candidates must undergo the full PQ process in the first year.
2. In place of repeating the full PQ process the second year, candidates will complete Sections I-IV of the Polar Physical Qualification Packet and submit it, depending on their affiliation, to UTMB, CU-Polar Medicine or the NSF Health Unit for review.
3. Before you will be authorized to deploy the second year, you must comply with the following requirements:
    a. Flu Shot, MMR, TB testing, and COVID 19 and applicable boosters for all personnel.
    b. HIV testing, blood type, and Rh for mandatory and voluntary walking blood bank.

The two-year PQ process takes into account that these candidates are likely to represent a low risk for adverse medical outcomes during a second deployment year and therefore may be adequately screened by a review of their medical history and self-assessment.

Approval under this exception requires that candidates deploy in the first year of their authorized PQ period in order to be eligible to deploy under the abridged process in their second year.

5.2.3. Pilot Program: Expansion of Two-Year PQ Program

Concerns have been raised that the current Physical Qualified/Not Physical Qualified (PQ/NPQ) process is cumbersome for both the applicant, NSF and its contractors and is a “one size fits all” rather than risk based approach. In an effort to be responsive to this concern, the Simplified PQ Process is being piloted.

5.2.3.(a). Eligibility

1. Deployment to McMurdo summer only (7 days or less trips to Pole and field camps within a day trip are authorized)
2. If a participant is planning to winter-over, they should not participate in the abbreviated PQ process since the majority of the lab work cannot be completed at the McMurdo Clinic and a complete PQ process would be required.
3. Have one prior deployment within the last 3 years to any of the U.S. Antarctic Stations AND did not require a medical waiver
4. Age 65 or under
5. BMI less than 30 (consistent with CDC definition overweight and below)
6. Confirms no change in health status since last PQ
7. Positions are mostly administrative in nature

5.3. Emergency Deployments

PQ decisions are made in a timely manner, yet it is acknowledged that the process takes a significant amount of time to complete; examinations and tests must be scheduled and completed, candidates must return the information for evaluation, and the information must then be thoroughly reviewed. OPP has on occasion authorized a streamlined process for emergency deployments, such as when they are necessary to conduct investigations, preserve evidence, or make emergency repairs. These exceptions are always and only made for limited purposes, and candidates will not be authorized to deploy again without completing the standard PQ process.

The requirements will differ according to the station or vessel to be visited, the anticipated length of the deployment, and the purpose of the deployment. Each streamlined process shall be developed and agreed to by the OPP senior advisor for Polar Medical Programs, the OPP Chief Medical Advisor, and the ASC medical director. For example, authorization to deploy to the South Pole may require an acclimatization period.

5.4. Reciprocal PQ Program

5.4.1. Federal Aviation Administration (FAA)

OPP accepts valid, first-class medical certificates for FAA/Flight Inspections Services personnel participating in the annual certification of McMurdo and South Pole runways. In the absence of such certificates, personnel will be required to complete the standard PQ process.

5.4.2. Edison Chouest Offshore (ECO)

OPP accepts ECO's certification that every crew member who is present south of 60° south latitude has passed the U.S. Coast Guard physical and meets any additional requirements imposed by OPP, such as those related to vaccinations and immunizations.

5.4.3. NOAA

For NOAA personnel transiting on OPP research vessels, OPP accepts NOAA's two-tier review that involves a full physical examination (which explicitly considers the difficult conditions and the physical labor required at its field camps), lab tests, and required vaccinations.

The first tier is certification by each person's physician that all conditions and vaccinations have been met and the person is fully fit for duty. The second tier involves review of all material by the emergency medical physicians at George Washington University's Medical Maritime Access program.

5.4.4. Observers

Observers are placed on board USAP vessels working in the Argentine and Chilean Exclusive Economic Zone. OPP accepts a medical certificate stating generally that the individual is in good health and does not show any apparent illness. The observers must hand-carry a copy of their medical records, and they must comply with OPP's infectious diseases requirements:

- Annual flu shot
- Negative test for latent and active TB
- Measles, mumps, rubella vaccine
- COVID 19 and applicable boosters

Note: these requirements apply only if the vessel will travel south of 60° south latitude. If staying north of 60° south latitude, no part of the PQ process is necessary.

5.4.5. National Antarctic Programs (NAPs)

OPP currently accepts the PQ determinations from the NAPs of the following countries:

Argentina	Japan
Australia	South Korea
Chile	New Zealand
China	South Africa
France	Sweden
Germany	Ukraine
Italy	United Kingdom

The following conditions apply:

- U.S. candidates collaborating with other NAPs may PQ through the NAP.
- OPP does not accept PQ determinations of other NAPs for U.S. participants deploying to U.S. stations or vessels.
- In addition to any tests and examinations that are required by a NAP, OPP imposes infectious disease requirements that must be complied with even if the NAP does not require the same. These are:
    - Annual flu shot
    - Negative test for latent and active TB
    - Measles, mumps, rubella vaccine
    - COVID-19 and applicable boosters
- Candidates must also meet all winter-specific requirements, even if their NAP does not require the same.
- Individuals must hand-carry a copy of their medical records.

5.4.5.(a). NAP Process

- The candidate undergoes the NAP's PQ process.
- The NAP has the ultimate say in whether or not it will physically qualify a person scheduled to deploy to a USAP location.
- Once the NAP determines that the person is physically qualified according to the NAP's standards and has met the OPP infectious diseases requirements, the authorized program representative (usually the medical officer, medical administrative manager, or head of the national Antarctic program) advises the senior advisor for Polar Medical Programs that the person is considered PQ'd.

6. Waivers

NSF's physical qualification program allows individuals, with their employer's endorsement, to apply for a waiver. When a waiver is granted, it means that strict application of a particular standard is waived. Final decisions of waivers are made by the Polar Medical Program Senior Advisor. Though a person does not meet the specific guideline, the risk and benefit of the deployment is assessed based on a number of factors (specific guideline in the context of the person's entire medical situation, length of

deployment, location/isolation of deployment with associated medical resources, potential progression of disease, etc.).

There may be conditions or restrictions associated with approved waivers. When this is the case, they will be explicit. The conditions or restrictions may require additional tests, certain medications, or limitations on deployment length or location.

UTMB (USAP) and CU-Polar Medicine (Arctic) are responsible for ensuring that waiver conditions are made known to clinic staff at the deployed location and, when appropriate, to NSF representatives.

NSF recently authorized UTMB/CU-Polar Medicine to institute a new procedure for individuals who in the past have had to submit waiver requests year-after-year for chronic yet stable diseases and conditions. If there is improvement or no change in the individual's condition, UTMB/CU-Polar Medicine will document that although the waiver condition persists there is nothing in the medical record to indicate that the waiver should not be renewed. This practice will save UTMB, CU-Polar Medicine and OPP significant time and administrative burden while not increasing the risk either to the individual or the program (whether Arctic or Antarctic). It should be noted that UTMB and CU-Polar Medicine are also empowered to require that the individual again pursue a waiver.

It is permissible to send medical files and waiver materials between UTMB, CU-Polar Medicine and NSF via encrypted e-mail, with a separate message containing the password required to access the record.

7. Policy Review

This policy is valid until rescinded. It will be reviewed at an interval of not more than five years. The expansion of the two-year PQ pilot will remain in effect for three years unless cancelled early.

8. Contractors Medical Waiver Processes (Pre-deployment)

Submission

- After submission of PQ pacakge, applicant receives UTMB's letter of determination that includes instructions for waiver requests
- Applicant submits via fax or mail the "Application for Waiver "Not Physically Qualified" Determination", which includes "Statement and Release of Liability", "Employer Endorsement", and "Employer Release of Liability"

Review

- UTMB's Medical Director reviews "Application for Waiver" and provides waiver recommendation
- UTMB's Administraive Support submits the "Application for Waiver" and waiver recommnedation to Polar Medical Program Manager
- ASC's Medical and Emergency Manager notifies the Polar Medical Program of the applicant's criticality, position, location, and season
- The OPP Chief Medical Advisor reviews "Application for Waiver" and may request additional participant information
- OPP Chief Medical Advisor provides the waiver recommendation to Polar Medical Program Manager
- Polar Medical Program Manager provides the Polar Medical Program Senior Advisor the OPP's Chief Medical Advisor and UTMB's Chief Medical Directors recommendations

Determination

- Polar Medical Program Senior Advisor makes the final waiver determination
- The Applicant will receive the final waiver determination via email or mail from the Polar Medical Program Senior Advisor or Polar Medical Program Manager

9. Grantee Medical Waiver Processes (Pre-deployment)

Submission

- After submission of PQ pacakge, applicant receives UTMB's letter of determination that includes instructions for waiver requests
- Applicant submits via fax or mail the "Application for Waiver "Not Physically Qualified" Determination", which includes "Statement and Release of Liability", "Employer Endorsement", and "Employer Release of Liability"
- For Grantees, the University must endorse and accept release of liability

Review

- UTMB's Chief Medical Director reviews "Application for Waiver" and provides waiver recommendation
- UTMB's Administraive Support submits the "Application for Waiver" and waiver recommnedation to Polar Medical Program Manager
- Polar Medical Program Manager notifies the applicable NSF Science Program Officer of waiver request to determine applicant criticality, position, location and season
- Polar Medical Program Manager provides Chief Medical Advisor applicant criticality, position, location , and season
- The OPP Chief Medical Advisor reviews "Application for Waiver" and may request additional participant information
- Chief Medical Advisor provides the waiver recommendation to Polar Medical Program Manager
- Polar Medical Program Manager notifies the applicable NSF Science Program Officer of the waiver recommendation
- Polar Medical Program Manager provides the Polar Medical Program Senior Advisor the Chief Medical Advisor and UTMB's Medical Director's recommendations

Determination

- Polar Medical Program Senior Advisor makes final waiver determination
- The Applicant will receive the final waiver determination via email or mail from the Polar Medical Program Senior Advisor or Polar Medical Program Manager

10. Intergovernmental Personnel Act (IPA) Medical Waiver Processes (Pre-deployment)

Submission

- After submission of PQ pacakge, applicant receives UTMB's letter of determination that includes instructions for waiver requests
- Applicant submits via fax or mail the "Application for Waiver "Not Physically Qualified" Determination", which includes "Statement and Release of Liability", "Employer Endorsement", and "Employer Release of Liability"

Review

- UTMB Medical Director reviews "Application for Waiver" and provides waiver recommendation
- UTMB's Administraive Support submits the "Application for Waiver" and waiver recommnedation to Polar Medical Program Manager
- Polar Medical Program Manager provides Chief Medical Advisor applicant criticality, position, location , and season
- The OPP Chief Medical Advisor reviews "Application for Waiver" and may request additional participant information
- Chief Medical Advisor provides the waiver recommendation to Polar Medical Program Manager
- Polar Medical Program Manager provides the Polar Medical Program Senior Advisor the Chief Medical Advisor and UTMB's Medical Director's recommendations

Determination

- Polar Medical Program Senior Advisor makes final waiver determination
- The Applicant will receive the final waiver determination via email or mail from the Polar Medical Program Senior Advisor or Polar Medical Program Manager

11. Arctic Personnel Medical Waiver Processes (Pre-deployment)

Submission

- After submission of PQ pacakge, applicant receives CU-Polar Medicine's letter of determination that includes instructions for waiver requests
- Applicant submits via fax or mail the "Application for Waiver "Not Physically Qualified" Determination", which includes "Statement and Release of Liability", "Employer Endorsement", and "Employer Release of Liability"
- For Grantees, the University must endorse and accept release of liability

Review

- UC-Polar Medicine's medical provider reviews "Application for Waiver" and provides waiver recommendation
- UC-Polar Medicine submits the "Application for Waiver" and waiver recommnedation to Polar Medical Program Manager
- Polar Medical Program Manager notifies applicable Arctic Research & Support Logistics Program Officer to determine applicant's criticality, position, location, and duration
- Polar Medical Program Manager notifies OPP's Chief Medical Advisor of applicant's criticality, position, location, and duration
- The OPP Chief Medical Advisor reviews "Application for Waiver" and may request additional participant information
- Chief Medical Advisorprovides the waiver recommendation to the Polar Medical Program Manager
- Polar Medical Program Manager notifies the applicable NSF Science Program Officer of the waiver recommendation
- Polar Medical Program Manager provides the Polar Medical Program Senior Advisor the Chief Medical Advisor and UC- Polar Medicine's medical provider's recommendations

Determination

- Polar Medical Program Senior Advisor makes final waiver determination
- The Applicant will receive the final waiver determination via email or mail from the Polar Medical Program Senior Advisor or Polar Medical Program Manager

12. National Science Foundation Staff Medical Waiver Processes (Pre-deployment)

Submission

- After submission of PQ package, applicant receives NSF OPP's letter of determination that includes instructions for waiver requests
- Applicant requests waiver initiation via email to Polar Medical Program Manager

Review

- Polar Medical Program Manager notifies OPP's Chief Medical Advisor of waiver request
- Polar Medical Program Manager provides Medical Advisor applicant's criticality, position, location , and season
- The Chief Medical Advisor reviews applicant's PQ package
- Chief Medical Advisor provides the waiver recommendation to Polar Medical Program Manager
- Polar Medical Program Manager provides the Polar Medical Program Senior Advisor the Chief Medical Adivor's recommendations

Determination

- Polar Medical Program Senior Advisor makes final waiver determination
- Applicant receives the final waiver determination via email or mail from the Polar Medical Program Senior Advisor or Polar Medical Program Manager

(Enclosure 5)

13. Physical Qualification Determination Process (Grantees, Contractors, IPAs, Arctic Personnel)

Physical Completion

- Applicants receive the "UTMB PQ Packet" email, which provides detailed instrcutions on physical completion
- Applicants complete/Sign ALL forms in the PQ Packet
- Applicants schedules/completes lab collection
- Applicants schedules/completes physician visit
- Applicants schedules/completes dentist visit
- Applicants package ALL forms/results and return to UTMB via fax or mail
- Applicants are recommended to maintain a copy of completed PQ package for personal records
- UTMB sends the applicant an email acknowledging receipt, generally within 2 business days

Review

- Physical Qualifications (PQ) forms reviewed for determination by UTMB's licensed healthcare provider
- Determination is graded against the Polar Medical Screening Guidelines
- Note: Additional guidelines may be instituted to minimize or mitigate risks, for example, the CDC COVID-19 High Risk Categories were implemented as temporary modified guidelines to minimze risk during the pandemic

Classification

- UTMB notifies the applicant of PQ packet determination: Physically Qualified (PQ) or Not Physically Qualified (NPQ)
- Applicants that receive a PQ designation, can receive further classification of restricted or unrestricted
  - Restricted: allows for deployment during the summer months. It implies that there is a medical condition that warrants reassessment before a clearance decision for winter deployment
  - Unrestricted: allows the applicant to travel to all sites on the continent and authorizes medical clearance for winter-over candidates
- For Applicants that receive an NPQ detemination, detailed instructions are provided in the UTMB notification for submittal of a waiver application

14. Physical Qualification Determination Process (NSF Staff and Distinguished Visitors)

Physical Completion

- Applicant requests a PQ packet via AIL Program Specialist, which provides detailed instrcutions on physical completion and Pipeline Number
- Applicant completes/signs ALL forms in the PQ Packet
- Applicant schedules/completes lab collection
- Applicant schedules/completes physician visit
- Applicant schedules/completes dentist visit
- Applicants package ALL forms/results and return to NSF OPP OH via email, mail, or fax (per initial instructions)
- Applicants are recommended to maintain a copy of completed PQ package for personal records
- Polar Medical program Manager sends the applicant an email acknowledging receipt

Review

- Physical Qualifications (PQ) forms reviewed for determination by OPP's Chief Medical Advisor
- Determination is graded against the Polar Medical Screening Guidelines
- Note: Additional guidelines may be instituted to minimize or mitigate risks, for example, the CDC COVID-19 High Risk Categories were implemented as temporary modified guidelines to minimze risk during the pandemic

Classification

- Polar Medical Program Manager or Senior Advisor notifies the applicant of PQ packet determination: Physically Qualified (PQ) or Not Physically Qualified (NPQ)
- Applicants that receive a PQ designation, can receive further classification of restricted or unrestricted
  - Restricted: allows for deployment during the summer months. It implies that there is a medical condition that warrants reassessment before a clearance decision for winter deployment
  - Unrestricted: allows the applicant to travel to all sites on the continent and authorizes medical clearance for winter-over candidates
- For Applicants that receive an NPQ detemination, detailed instructions are provided in the NSF notification for submittal of a waiver application

Appendix I: POLAR MEDICAL 2022-2023 GUIDELINES

Antarctica is the highest, driest, and coldest continent on earth. Temperatures at McMurdo Station are frequently below freezing in the summer, while at the South Pole average winter temperatures dip below –100 degrees F. Employees live in a confined space during persistent periods of summer daylight or winter blackness. Altitudes vary from sea level at McMurdo and Palmer Stations to 9,000 feet at the South Pole.

Due to the remoteness of the continent, access to advanced medical care is limited. Medical facilities in Antarctica can comfortably manage routine primary care problems, but advanced diagnostic technology and specialty medical expertise is not readily available. Under optimal conditions, a medical evacuation from McMurdo Station to New Zealand may range from 24 to 96 hours or longer in the summer season. From Palmer station, the process is a minimum of three days. Winter medical evacuations are high-risk events that may take days to weeks and may be impossible.

The delivery of pharmaceuticals, supplies, and equipment to the medical clinics in Antarctica takes weeks to months and may be impossible during winter. Laboratory diagnostics are limited to basic cell counts and chemistry profiles. Imaging is standard x-rays and limited ultrasound.

The physical qualifications for deployment are based on recommendations from OPP's Medical Review Panel and a review of medical screening guidelines from the U.S. Navy, the Peace Corps, and NASA. These recommendations have been modified to accommodate to the unique conditions of the polar regions. The types of medical clearance are defined as follows:

1) **Unrestricted** – This clearance applies to all candidates who have reasonable health that will not require advanced evaluation or treatment in Antarctica. Unrestricted summer clearance allows the applicant to travel to all sites on the continent. Unrestricted winter clearances authorizes deployment to a specific station during the winter season.

2) **Restricted** - This clearance indicates that the applicant has some medical concerns requiring further evaluation or is at risk of recurrence of a condition that would require a medical evacuation. Restricted clearance allows for deployment during the summer months. It implies that there is a medical condition that warrants reassessment before a clearance decision for winter deployment. Winter deployment is considered on a case-by-case basis. In certain cases, the physician advisor may advise restricting the applicant to certain locations on the continent.

The screening guidelines also include criteria for the ordering and successful completion of a cardiovascular exercise stress test and for drug and alcohol clearance.

The following guidelines are not intended to be exhaustive of every possible condition. The National Science Foundation and its advisors shall consider additional factors, including, but not limited to, location, duration, and purpose for Antarctic deployment, as well as the presence or need for any medical devices (such as catheters, ports, and defibrillators) in its final determination as to the medical suitability of any individual.

PQ/NPQ and Waiver Process

1. The Medical Screening Guidelines – 2022-2023 Medical Screening Guidelines is the primary source utilized by the medical chart reviewer to classify applicants.

   All patients falling in the NPQ category per medical screening guidelines for deployment to Antarctica must request a waiver if they wish to deploy. All waiver requests are reviewed by the NSF or an agent representing the NSF.

2. Summer-only clearances may be reassessed if the USAP participant requests winter- over status. The medical advisor is authorized, and if necessary, upon consultation with the physician on station, to make a clearance decision. The Medical Advisor will briefly document rationale for the clearance decision. An applicant may request a waiver if the decision is NPQ. The Antarctica physicians, including the on-site winter physician, have direct input into whether they think they can handle the medical problem in question.

3. The medical chart reviewer may change a summer-only PQ to unrestricted PQ or to an NPQ if new facts come to light. Such facts might arise from medical conditions that develop following the initial clearance decision or when new medical facts are provided.

4. Any change that would remove a restriction imposed through an NSF-granted waiver cannot be implemented without consultation with NSF. The medical chart reviewer should submit reasons for requesting a change, in writing, to the NSF

Medical and Laboratory Testing Requirements

Testing Specifications

1. Medical Self History (pages 1-5 with page 5 signed)
2. Polar Physical Examination (see 5.2 Two-Year PQ Program for exceptions)
3. Behavioral Health Assessment (South Pole Winter-over)
4. Any MD notes
5. Immunizations (influenza, Measles, COVID-19 vaccine, TDAP, and tuberculin skin test (PPD)/Quantiferon)
6. Chest X-Ray
    a. If wintering over at South Pole (omit if low-dose CT scan performed)
    b. Per TB protocol for positive PPD/ Quantiferon; or if exhibiting symptoms of pulmonary disease
    c. Provide report only, do not need actual x-ray.
    d. Low-dose CT of the chest (screening for lung cancer)
7. South Pole winter only
    a. Screen participants at high-risk for lung cancer
        i. Age 55 to 80 years and:
        ii. A history of smoking at least 30 pack-years and, if a former smoker, had quit within the previous 15 years.
8. Lab Test results
    a. Austral summer all stations, McMurdo winter-over and Summit Station, as below:
        i. Complete Blood Count with Differential
        ii. Blood Chemistries (Sodium, Potassium, Chloride, Glucose, Creatinine, GFR/BUN, Calcium)
        iii. Hepatic Panel (Alkaline, Phosphatase, Total Bilirubin, AST, ALT)
        iv. Lipid Panel (Cholesterol, HDL, LDL, Triglycerides)
        v. Hepatitis B core total antibody
        vi. Hepatitis C antibody
        vii. RPR (syphilis)
        viii. Blood Type (ABO and RH)
        ix. TSH (with history of thyroid disorder only)
        x. HIV (USAP only- walking blood bank and wintering over)
        xi. HgA1c (diabetics and fasting blood glucose levels of 100-125 mg/dL)
        xii. Guaiac Stool test (50+)
    b. South Pole Winter-over, as below:
        i. Complete Blood Count with Differential
        ii. Blood Chemistries (Sodium, Potassium, Chloride, Glucose, Creatinine,

GFR/BUN,Calcium)

iii. Hepatic Panel (Alkaline, Phosphatase, Total Bilirubin, AST, ALT)
iv. Lipid Panel (Cholesterol, HDL, LDL, Triglycerides)
v. Ferritin
vi. Hepatitis B core total antibody
vii. Hepatitis C antibody
viii. RPR (syphilis)
ix. Blood Type (ABO and RH)
x. Urinalysis with microscopy (and culture, if positive)
xi. Uric acid
xii. PSA (men age 50 and over)
xiii. TSH
xiv. HIV
xv. HgA1c (diabetics and fasting blood glucose levels of 100-125 mg/dL)
xvi. Guaiac Stool test (50+)

9. 12 lead EKG tracing or rhythm strip (new participants; every five yrs. if 40-49, and yearly 50+)
10. *Exercise Stress Test (as noted below)
11. PAP smear Cytology report with endocervical cell report /GYN notes (Required every 3 years for women ages 21-65 and wintering over)
12. Mammogram radiology report (Required every 2 years for women ages 40+ and wintering over)
13. Gallbladder Ultrasound report only (SP and MCM winter) (fast for 6 hours)
14. Pulmonary Function Test, pre/post bronchodilator (history of asthma, emphysema, or COPD) or Occupational PFT (spirometry if for work)
15. NSF Forms
16. Dental

NOTE: Health conditions may drive the need for additional testing. The previously mentioned are the minimum requirements.

Required Testing and Payment Responsibility

Initial Test	Required for	Paid by	Results require additional testing	Additional test paid for by
PPD/Quantiferon	All stations/all seasons	Program	Chest X-ray	Participant
Iron studies	South Pole winter only	Program	Ferritin	Program
Hepatitis B or C	All stations/all seasons	Program	Refer to PCP for Hepatitis evaluation	Participant
HIV	Walking Blood Bank and South Pole winter	Program	Refer to PCP for HIV evaluation	Participant

TSH	South Pole winter or history of thyroid disorder	Program	Free T4, T3, and thyroglobulin antibody	Program
Chest X-ray	South Pole winter; see above for other criteria	Program	N/A	N/A
Exercise Stress Test	South Pole winter	Program	cardiac echo, etc	participant
Exercise Stress Test	If required according to FHR guidelines	Participant	cardiac echo, etc	participant
PAP	South Pole winter only	Program	Refer to PCP	Participant
Mammogram	South Pole winter only	Program	Refer to PCP	Participant
PSA	South Pole winter only	Program	Refer to PCP	Participant
Pulmonary Function	Asthma COPD Smoking OSHA	Participant TBD Contractor	N/A	N/A
Guaiac	stations/all seasons	gram	N/A	N/A
Uric acid	ıth Pole winter only	gram	Refer to PCP	Participant

Exercise Stress Testing (ETT)
Indications for screening cardiovascular stress test:

a. **Summer participant only**: An exercise stress test will only be required if the participant's Framingham Risk Score is calculated to be greater than 20%. If a stress test is required, it will be evaluated using the same criteria applied to winter participants. The Framingham Risk Calculator can be accessed at the following website:
b. http://cvdrisk.nhlbi.nih.gov/
c. **Winter participant**: Cardiovascular stress tests are required every two years from 50-59 and yearly after the age of 60.

Criteria for successful completion of cardiovascular stress test:

1. No chest pain, marked dyspnea or claudication
2. Normal increase in BP response to exercise
3. No significant ST depression, arrhythmia or exercise induced hypoxemia
4. Complete 9 minutes
5. >85% max predicted heart rate achieved.
6. Sustained work level of 10 Mets for 3 minutes (completion of Stage 3 Bruce Protocol).
7. Physician interpretation of "negative" or "low probability" of ischemia.

Vaccinations and Infectious Disease
The PQ Determination Policy concerning vaccinations primarily follows the recommendations of the Center for Disease Control and Prevention (CDC) and the Advisory Committee on Immunization Practices (ACIP). Any immunizing agent licensed by the Food and Drug Administration (FDA) or the Department of Health and Human Services (DHHS) may be used, as well as emergency use authorization (EUA) process. The requirements are based on CDC recommendations, host country requirements and OPP's Medical Review Panel.

Required Vaccinations:

- Tetanus
- Seasonal Influenza (exception for Arctic participants deploying in late spring/ summer)
- Measles
- COVID-19 (and applicable boosters).

Required Infectious Disease Testing:

- Hepatitis A
- Hepatitis B
- HIV (USAP only: Walking Bloodbank & Winter overs)
- Syphilis
- Tuberculosis.

Screening for immunity. For some vaccine–preventable diseases, serologic or other tests can be used to identify preexisting immunity from prior infection or immunization that may eliminate the need for unnecessary immunization. Such testing may be adopted where it offers advantages in terms of improved care or medical economics. Titers may be used for measles.

Behavioral Health and Psychiatry

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Psychiatric Diagnosis In DSM-5	Asymptomatic without psychotropic medications > 1 year and letter of clearance	Stable > 1 year and in active treatment of psychiatric illness (medication and/or psychotherapy); regular treatment provider "clears" for deployment; waiver for winter requires "cleared for winter over"	History of psychosis from any cause or psychiatric hospitalization within 3 years. In active treatment for psychiatric illness without "clears" for deployment. Medication change within one year	*Psychiatric care not generally available; some telemedicine and selected medications possible; some psychiatric conditions are chronic and recurrent.*
Eating Disorders (including anorexia and bulimia)		Stable > 3 years with normal examination and lab findings (e.g. BMI, potassium, protein)	Concern for eating disorder, with BMI < 17% or decreasing 10% over past 2 years. Signs of acute or chronic weight loss or gain (>10% body weight or outside normal values of height for weight), or abnormal relevant laboratory findings.	*Eating disorders potentially life threatening, expertise to treat is not available in Antarctica.*
Miscellaneous Disorders		Seasonal Affective Disorder Attention Deficit Disorder, mild, controlled on medications Dementia, mild	ADHD, poorly controlled, with or without meds. Dementia, moderate to severe	
Behavioral Health Assessment	South Pole Winter Behavioral Health Assessment finds qualified for deployment; Documented in Medical Record	Restricted Clearance Not Applicable since winter-over	South Pole Winter Behavioral Health Assessment finds NOT qualified for deployment; Documented in Medical Record	*Behavioral health assessment* ***applies to South Pole winter only,*** *and is primarily a suitability assessment.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Chronic Pain	No use of controlled substances		Use of controlled substances for management of non-acute pain on either an intermittent or continuous basis.	*Use of controlled medications increases the risk of operations in the Antarctic environment. Waivers require statement from physician regarding need for medication and statement acknowledging the risks of use in a remote Polar environment. Provider must agree to provide the entire supply necessary while participant is on ice. Participant must agree not to use medications while working. Waivers not approved for heavy equipment or other high-risk occupation*

Breast Disease

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Breast Cancer	Carcinoma of the breast, duration > 5 years prior to deployment, with no evidence of recurrent or metastatic disease, S/P subtotal or radical mastectomy, with negative lymph nodes.	Carcinoma of the breast, duration > 1 but < 5 years prior to deployment, with no evidence of recurrent or met-astatic disease, S/P subtotal or radical mastectomy, with negative lymph nodes.	Carcinoma of the breast, duration < 1 year prior to deployment, or with evidence of recurrent or metastatic disease, or S/P subtotal or radical mastectomy, with positive lymph nodes.	*High risk of recurrence, no mammography available, CT and nuclear medicine not available in Antarctica*
Breast Mass	Any breast mass, determined to be benign by biopsy, aspiration or mammogram, with follow-up examination advised for no less than 1 year after the evaluation.	Any breast mass, determined to be benign by biopsy, aspiration or mammogram, with follow-up examination advised for > 6 months after the evaluation (except South Pole winter).	Any breast mass, determined to be benign by biopsy, aspiration or mammogram, with further imaging advised for < 6 months after the evaluation.	*Mammography unavailable*

Cardiovascular

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
General	Absence of clinical symptoms or signs of angina, congestive heart failure, syncope or arrhythmia, with a baseline ECG indicating no evidence of MI, significant arrhythmia, conduction delays or ventricular hypertrophy.	Medical signs or symptoms of angina, congestive heart failure, arrhythmia, including dizziness, syncope and palpitations, with a normal evaluation including a stress ECG, holter monitor and cardiology consultation addressing the presumptive etiology and prognosis for the underlying condition.	Winter-over, field camp or South Pole candidates with any current evidence of signs, symptoms, or cardiovascular tests suggestive of a current cardiac condition, excluding benign structural abnormalities. Unexplained chest pain, dyspnea, orthopnea or edema. Cardiac conditions treated with medications that may require drug monitoring. Such medications may include, but are not limited to, warfarin, digoxin, and certain antiarrhythmics.	*Limited capacity to diagnose and treat cardiovascular disease on the Antarctic continent.* *Remote or winter evacuation unfeasible.* *Cardiac conditions treated with medications that require drug monitoring. Such medications may include, but are not limited to, digoxin, and certain antiarrhythmics.*
ECG	Minor ECG abnormalities, of no clinical significance.	Cardiac pacemaker, for demand purposes of physiological sinus bradycardia, with letter from cardiologist documenting pacemaker is current and not malfunctioning.	Signs, symptoms or ECG evidence of an arrhythmia or conduction abnormality for which a cardiac etiology cannot be reasonably excluded. Cardiac pacemaker, for reason other than sinus bradycardia.	*Limited capacity to diagnose and treat cardiovascular disease on the Antarctic continent.* *Treatment unavailable*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Exercise Stress Test (Summer required only if FHR score is greater than 20%)	Completion of an adequate standard Bruce Protocol stress test to > 9 minutes with no symptomatic nor electrocardiographic evidence of ischemia	Completion of an adequate standard Bruce Protocol to > 6 but <9 minutes with no symptomatic nor electrocardiographic evidence of ischemia	Completion of an adequate standard Bruce Protocol to < 6 minutes, or with symptomatic and/or electrocardiographic evidence of ischemia. Termination of standard Bruce Protocol Stress Test with heart rate < 85% of predicted value.	*Further diagnostic testing indicated.*
Pericarditis	History of pericarditis, resolved, > 5 yrs, absence of clinical findings, and no underlying systemic illness. Pericarditis, <5 yrs, with normal ECG and echocardiogram, absence of clinical findings, and no underlying systemic illness.		History of pericarditis, recurrent, with abnormal ECG or echocardiogram, presence of clinical symptoms or with an underlying systemic illness.	

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Valvular Heart Disease	Valvular heart disease, with no clinical symptoms, no evidence of CHF, arrhythmia or ventricular hypertrophy.	History of heart valve replacement > 1 year prior to deployment, with no clinical signs or symptoms and a normal stress echocardiogram	Valvular heart disease with symptoms, CHF, decreased LVEF, or arrhythmia. Idiopathic Hypertrophic Subaortic Stenosis	*Risk of sudden cardiac death. Limited ability to do stress testing and echocardiography.*
Hypertension	Hypertension, well controlled with or without medication, with BP < 140 systolic and 90 diastolic.	Hypertension, with BP > 140 and < 160 systolic or > 90 and <100 diastolic.	Hypertension, with BP >160 systolic or >100 diastolic.	
Ventricular Hypertrophy		Left ventricular hypertrophy, with no clinical signs or symptoms, no arrhythmia, normal blood pressure, no diabetes, hyperlipidemia or smoking > 5 years	Left ventricular hypertrophy, with the following: signs, symptoms, or ECG evidence of arrhythmia, valvular heart disease, hypertension, diabetes, hyperlipidemia or history of smoking	*Increased risk of progression and unsuitable risk of cardiovascular event.* *Pathologic*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Congestive Heart Failure		CHF, resolved, asymptomatic, with or without control on medical therapy, with LVEF > 50%	CHF, symptomatic or with LVEF < 50%.	*Risk of sudden death. Long term antiarrhythmic therapy is unavailable.*
Coronary Artery Disease		History of atherosclerotic heart disease, with no current evidence of diabetes mellitus, smoking, hypertension not controlled on medication, LDL Chol < 100, Chol/HDL < 5, nonsmoker > 5 years and normal nuclear stress test or stress echo.	History of atherosclerotic heart disease, with current evidence of diabetes mellitus, smoking, hypertension not controlled on medication, LDL Chol >100, Chol/HDL > 5, smoking history < 5 years prior to deployment, or with abnormal nuclear stress test or stress echocardiogram.	Unacceptable risk of recurrent disease.
Myocardial Infarction		History of MI, > 1 year prior to deployment, with no clinical findings of angina, arrhythmia or CHF, normal recent (less than one year) stress echocardiogram, nuclear stress tests or non-obstructive coronary artery disease on angiography, with normal blood pressure, no evidence of diabetes. LDL Chol < 100,	History of MI, < 1 year prior to deployment, or with clinical findings of angina, arrhythmia or CHF, or with recent abnormal stress test echocardiogram, nuclear stress tests or obstructive coronary artery disease on catheterization, or with hypertension not controlled on medication, diabetes, LDL Chol > 100, Chol/HDL > 5, or smoking < 5 years prior to deployment.	

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Coronary Bypass Coronary Stents		History of coronary bypass graft or stent > 12 mos. prior to deployment, with no clinical findings of angina, arrhythmia or CHF, normal recent stress echocardiogram, nuclear stress tests or non-obstructive coronary artery disease on catheterization, with normal blood pressure, no diabetes LDL Chol < 100, Chol/HDL < 5, no smoking for > 5 years prior to deployment and note from cardiologist confirming fitness for deployment.	History of coronary bypass graft or stent NPQ if < 12 months since procedure. If > 12 months with clinical findings of angina, arrhythmia or CHF, or with abnormal stress echocardiogram, nuclear stress tests or obstructive coronary artery disease on catheterization, or with hypertension not controlled with medication, diabetes, LDL Chol > 100, Chol/HDL > 5, or smoking history < 5 yrs prior to deployment. Coronary bypass and/or stent is NPQ for South Pole and Summit Station winter, though can be waiverable	*Incidence of graft or stent occlusion decreases after first 12 months.* *South Pole and Summit Station winters have extreme evacuation challenges*
Cardiac Arrhythmia	NSR, sinus arrhythmia, premature atrial contractions, first degree AV block, nonconsecutive unifocal PVCs Supraventricular tachycardia, resolved, last episode > 5 yrs prior to deployment.	SVT, single occurrence, with no recurrence > 1 but < 5 years prior to deployment. Mobitz Type I heart block.	SVT, >1 occurrence, or < 1 year prior to deployment. Mobitz Type II heart block. Chronic atrial fibrillation, on or off warfarin. Other ventricular arrhythmias	*Recurrent SVT and Mobitz Type II require further diagnostic testing.*

Dental

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Impacted Third Molars	Fully erupted third molar with no caries or periodontal disease. Asymptomatic fully impacted third molar with no radiographic pathology.	Partially erupted third molars, patient age > 30 years. Lack of opposing occlusion in the case of a nonfunctional third molar.	Symptomatic, or with letter from dentist advising extraction. Partially erupted third molars, patient age < 30 years. Periodontal probe can contact the crown of an unerupted third molar.	*At risk for becoming symptomatic.*
Abscessed Tooth	Periapical or periodontal infection, resolved with root canal or periodontal therapy, or extraction.		Periapical or periodontal infection, current.	
Orthodontics, Braces, Retainers	Fixed or removable orthodontic retainer only, with no active appliance.	Braces, duration > 2 months, summer only, where dental care accessible, and x-ray evidence of stability.	Braces, duration < 2 months, or winter deployment.	*Orthodontic therapy requires monthly follow-up.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Caries Root Canal Restorations	Incipient lesions that have not advanced through the enamel. Root canal or bridge, adequately treated, sealed and permanently restored. Complete permanent restorations.		Caries that have advanced through the enamel. Defective restoration (recurrent decay, fractures, open margin). Temporary restorations.	*Untreated caries has increased risk of abscess.*
Dentures	Well fitting.		Fractured or ill fitting.	
Fractured Teeth Missing Teeth	Restored or missing teeth.		Fractured tooth.	
Periodontal Disease	Early disease, bleeding pockets < 5 mm. depth, no bone loss, requiring no therapy.	Early disease, bleeding pockets < 5 mm. depth, mild bone loss,. requiring scaling every 6 months.	Advanced periodontal disease, or with bleeding pockets >5 mm. Depth.	
Congenital **Cleft Palate** **Dentinogenes is Imperfecta** **Amelogenesis Imperfecta**	Cleft palate repair, no residuals.	Dentinogenesis Imperfecta Amelogenesis Imperfecta Congenital abnormality, with evaluation by dentist and letter of clearance.	Congenital abnormality, with no dental consult or letter of clearance. Cleft palate or other deformities, severe, producing speech or eating impairments.	*Congenital defects require evaluations every six months.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Temporo-mandibular Joint	Asymptomatic for > 5 years. Surgery > 6 months, asymptomatic	Asymptomatic for > 6 months but < 5 years, with letter of documentation from treating dentist. Uses night guard or requires occasional NSAID therapy, with letter of documentation from treating dentist.	Symptomatic, requiring chronic NSAID therapy, supplementary analgesics, or < 6 months after TMJ surgery.	

Dermatology

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
General	Actinic keratosis. Nevi, no dysplasia. Cyst, without symptoms, or excised, no required dressing changes or follow-up care. Viral warts.	Nevi, Multiple, with history of dysplasia.	Cyst, with symptoms, or excised, but requiring dressing changes or other follow-up care.	*Benign skin lesions can be treated at all facilities. All cyst excisions should be completely healed prior to deployment.* *No pathology services available in winter.*
Acne	Acne, untreated, or acne, treated with accutane therapy, duration > two months prior to deployment.		Acne, treated with accutane therapy, duration < two months prior to deployment.	*Accutane therapy requires laboratory monitoring, ongoing therapy is a specialty service.*
Malignant Melanoma	Malignant melanoma, depth < .75mm, and excised greater than five years prior to deployment, with no evidence of recurrence.	Malignant melanoma, depth >.75 mm and excised greater than five years prior to deployment, with no evidence of recurrent or metastatic disease	Malignant melanoma, depth > .75 mm, or excised less than five years prior to deployment. Malignant melanoma, recurrent or metastatic.	*Limited diagnostic equipment. Melanomas > .75 mm. at risk for metastatic disease.*
Basal Cell Carcinoma	Basal cell carcinoma, single episode.	Basal cell carcinoma, multiple sites, inactive.	Basal cell carcinoma, active.	*No pathology services in winter.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Squamous Cell Carcinoma	Squamous cell carcinoma, duration > 5 years, no recurrence.	Squamous cell carcinoma, duration > 2 but < 5 years, no recurrence.	Squamous cell carcinoma, duration < 2 years, or with history of metastasis or local spread.	*Risk of recurrence, with inability to diagnose and treat during winter.*
Psoriasis Eczema	Atopic dermatitis, including psoriasis and eczema, well controlled, on no systemic immuno-suppressive therapy.		Atopic dermatitis, including psoriasis and eczema, poorly controlled, or requiring high dose systemic immuno-suppressive therapy.	*Limited diagnostic capacity, with risk of opportunistic infection*
Fungal or Tinea Infections	Fungal or tinea infections, superficial, with no systemic manifestations and no systemic antifungal therapy.	Fungal or tinea infections, superficial, requiring oral systemic therapy.	Systemic fungal infections.	*Systemic fungal therapy implies a chronically immuno-suppressed patient.*
Herpes Zoster	Herpes zoster, resolved, with no post-herpetic neuralgia.	Herpes zoster, with post-herpetic neuralgia, controlled with NSAID therapy.	Herpes zoster, active, or with post- herpetic neuralgia, poorly controlled with NSAID therapy.	*Pain control options are limited.*

Endocrinology and Metabolism

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
General			Diabetes insipidus, nephrogenic or vasopressin sensitive, treated or untreated. Addison's disease.	*Expertise unavailable on ice, exacerbations are difficult to diagnose.*
Gout	History of gout. Last episode > 6 months prior to deployment, with uric acid less than 8.5 mg/dl.	Gout, last exacerbation < 6 months prior to deployment, with uric acid < 8.5 mg/dl and IBW < 150%.	Gout, last exacerbation < 6 months prior to deployment, with uric acid >8.5 mg/dl or IBW > 150%.	*Diagnostic difficulties, requires chronic therap.*
Pituitary Adenoma	Pituitary adenoma, > 5 years prior to deployment, with normal radiographic evaluation, normal prolactin and TSH levels, and letter from endocrinologist stating confirming data and stating prognosis.	Pituitary adenoma, treatment > 1 but < 5 years prior to deployment, with normal radio-graphic evaluation, normal prolactin and TSH levels, and letter from endocrinologist stating confirming data and stating prognosis.	Pituitary adenoma, duration < 1 year prior to deployment.	*Limited diagnostic , therapeuti c*
Hypoglycemia	Reactive hypoglycemia		Hypoglycemia due to insulinoma.	*Reactive hypoglycemia is common.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Diabetes Mellitus Type I	DM-1, > 1 but < 20 years duration, and HBA1C <7.5, on stable insulin regimen, no significant hypoglycemia or DKA > 2 years prior to deployment and no other complications from DM with physician letter confirming ability to manage disease	DM-1, > 1 but < 20 years duration, and HBA1C <7.5, on stable insulin regimen, no significant hypoglycemia or DKA > 2 years prior to deployment, no complications with physician letter confirming ability to manage disease.	DM-1 < 1 or > 20 years duration, or HBA1C > 7.5 or changes in treatment regimen in previous 6 mos., DKA, or hypoglycemic seizures/syncope occurring within the past 2 years, with complications or with IBW > 130%. NPQ winter South Pole and Summit Stations	*Risk of infection, complications can be difficult to diagnose. Pharmaceutica l resources are limited. Recurrent hypoglycemia is difficult to manage. Evacuation options limited/non-existent in winter*
Diabetes Mellitus Type 2	NIDDM, duration < 20 years, controlled on dietary therapy with no complications and HBA1C < 7.5	NIDDM < 20 years duration with HBA1C 7.5- 8.0, on stable oral hypoglycemic or anti-hyperglycemic regimens, with no significant hypoglycemia or hyperglycemia > 2 years prior to deployment, no complications of DM-2, body weight < 130% IBW with physician support.	NIDDM > 20 years duration, or with HBA1C >8.0, treatment regimen change < 6 months prior to deployment, with significant hypoglycemia or hyperglycemia < 2 years prior to deployment, with complications of DM-2, or with body weight > 130% IBW; requires insulin for treatment	*Risks of infection, complications*
Thyroid Nodule	Solitary thyroid nodule, biopsy benign.		Thyroid nodule, undetermined etiology, no follow- up plan.	*Risk of cancer, surgical inter-vention not available.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Thyroid Cancer	History of papillary, follicular or mixed cell cancer of the thyroid, > 5 years prior to deployment, with radiological evidence of no recurrent or metastatic disease, normal TSH, and letter of confirmation from endocrinologist stating prognosis.	History of papillary, follicular or mixed cell cancer of the thyroid, > 2 but < 5 years prior to deployment, with radiological evidence of no recurrent or meta-static disease, normal TSH, and letter of confirmation from endocrinologist stating prognosis.	History of papillary, follicular or mixed cell cancer of the thyroid, < 2 years prior to deployment, or with radiological evidence of recurrent or metastatic disease, or with an abnormal TSH.	*Risk of recurrence is unacceptably high within first 5 years and cannot be treated in Antarctica.*
Graves Hyper-thyroidism	History of Graves hyperthyroidism, > 2 years prior to deployment, with normal TSH with or without thyroid replacement therapy, or > 1 year and normal TSH on thyroid replacement therapy.	History of Graves hyperthyroidism, duration > 1 year prior to deployment, with normal TSH, with or without thyroid replacement therapy.	History of Graves hyperthyroidism, < 1 year prior to deployment, or with an abnormal TSH	*Condition requires stabilization prior to deployment. After treatment, Graves disease has a high risk of hypothyroidism. TSH levels cannot be determined in Antarctica.*
Toxic Adenoma	Toxic adenoma or toxic multinodular goiter, > 2 years prior to deployment, with normal TSH.	Toxic adenoma or toxic multinodular goiter, > 1 but < 2 years prior to deployment, with normal TSH.	History of toxic adenoma or multi- nodular goiter, < 1 year prior to de-ployment, or with an abnormal TSH.	*Condition requires stabilization prior to deployment. Radioactive iodine therapy not available.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Hypo-thyroidism	History of hypothyroidism, any cause, with normal TSH on replacement therapy.	Abnormal TSH, undergoing treatment or note from physician stating planned follow-up.	History of hypothyroidism, any cause, with abnormal TSH, untreated or not under medical observation.	*Low risk for complications. Thyroid function testing is not available during the winter.*
Hypertrigly-ceridemia	Hypertryglyceri-demia with fasting triglycerides < 300.	Hypertryglyceri - demia with fasting triglycerides > 300 but < 500.	Hypertryglyceri- demia with fasting triglycerides > 500.	*Requires chronic therapy that should be instituted prior to deployment. Increased risk of pancreatitis and CAD.*
Hypercholes-terolemia	Hypercholesterol, age < 40 Hypercholesterolemia, with Cholesterol < 240, LDL <160 and Chol/HDL < 5.0.	Hypercholesterolemia, age > 40, with Cholesterol > 240 and <300, LDL >160 and <190, or Chol/HDL> 5.0 and < 6.0 in the presence of other cardiac risk factors, e.g., active smoker, obesity; hypertension controlled (SBP<140 and DBP<90; diabetes controlled HbA1c<7.5	Hypercholesterolemia, with Cholesterol > 300, LDL > 190 or Chol/HDL > 6.0 in the presence of other cardiac risk factors, e.g., active smoker, obesity, poorly controlled hypertension (SBP>140 or DBP>90), poorly controlled diabetes (HgA1c > or = 7.5).	*Requires chronic therapy, needs to be initiated prior to deployment. Chronic medication to be supplied in U.S.*

Gastroenterology

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
General	No clinical symptoms or signs of abdominal pain, bloating, nausea, anorexia, weight loss, changes in stool habits, blood in stool, persistent or chronic diarrhea or constipation, with normal physical examination and laboratory testing.	Irritable bowel syndrome, < 2 exacerbations per yr., normal imaging studies and/or colonoscopy and endoscopy, and symptoms well controlled by diet, stress reduction or prn medication. Stable LFTs, < 3X high normal.	Unexplained abdominal pain weight loss or anorexia. Unexplained blood in stool, either gross or occult. Colostomy. Increasing LFTs or LFTs > 3X high normal.	
Esophagus	Barrett's esophagus, with normal biopsy < 6 months prior to deployment.	Achalasia, post dilatation, with no recurrence < 2 years prior to deployment.	Barrett's esophagus with dysplasia.	*Risk of cancer, unable to do endoscopy or in Antarctica.*
Gastrectomy /weight loss procedures	No Unrestricted Clearance with partial gastrectomy, gastric bypass or lap banding procedure	No Restricted Clearance with partial gastrectomy gastric bypass or lap banding procedure	NPQ with Partial gastrectomy, gastric bypass or lap banding procedure. Not waiverable for South Pole or Summit Station winter.	*Risk of obstruction, endoscopy and surgery not available during winter.*
Bowel Obstruction	Partial procto-colectomy, > 2 yr. prior to deployment, with no evidence of recurrent disease as documented by colonoscopy, X-rays, and laboratory findings.	Bowel obstruction, etiology identified, > 2 years prior to deployment.	Bowel obstruction, occurring < 2 years prior to deployment.	*Risk of recurrence, UGI, BE and surgery unavailable during winter.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
GERD **Esophageal Stricture**	Gastroesophageal reflux disease or recurrent gastritis, episodic and well controlled on medication.	History of esophageal stricture or obstruction > 1 yr. prior to deployment, with normal upper gastrointestinal x-rays or endoscopy	History of esophageal stricture or obstruction < 1 yr. prior to deployment, or without current evidence of resolution.	*Risk of recurrence, treatment not available*
Peptic Ulcer UGI Bleeding	Peptic ulcer disease, including benign gastric ulcer, asymptomatic > 1 year prior to deploy-ment, or > 6 months prior to deployment, with no evidence of recurrent disease as	Upper gastrointestinal bleeding, with source identified at time of occurrence, duration > 2 but < 6 months prior to deployment, with no evidence of	Upper gastrointestinal bleeding, < 2 months prior to deployment. Upper gastro- intestinal bleeding, past etiology undetermined	*Diagnostic and therapeutic options limited. Increased risk of recurrence, UGI, endoscopy and surgery not available during winter season.*
Diverticular Disease	Diverticulosis, asymptomatic	Diverticulitis, single episode > 2 years prior to deployment	Diverticulitis, recurrent or last episode < 2 years prior to deployment	*Risk of recurrence, colonoscopy and BE unavailable, limited pharma-ceutical resources.*
Colonic Polyps	Adenomatous colonic polyps, with excision < 3 years prior to deployment	Adenomatous colonic polyps, with previous colonoscopy and excisional biopsy > 3 but < 5 years prior to deployment.	Adenomatous colonic polyps, with previous colonoscopy and excisional biopsy > 5 years prior to deployment.	*Evaluation indicated prior to deployment per U.S. practice standards.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
GI Cancer	Cancerous intestinal polyp, completely excised, not involving intestinal mucosa, with no recommended adjuvant therapy or diagnostic follow-up within the next	Cancer of GI tract, asymptomatic > 3 years, and no evidence of recurrent or metastatic disease, as documented by colonoscopy, endoscopy, radiological	Cancer of the gastrointestinal tract, liver, pancreas or peritoneum, < 3 years prior to deployment, or with evidence suggestive of recurrent or metastatic disease.	*Risk of recurrence, limited diagnostic and therapeutic options, surgery for bowel obstruction not available during*
Ulcerative Colitis		Ulcerative colitis or proctitis, with no exacerbations of symptoms > 5 yrs. with normal colonoscopy within six months prior to deployment.	Ulcerative colitis or proctitis, with last exacerbation < 5 years, or with an abnormal gastro-intestinal x-ray or colonoscopy.	*Limited diagnostic and therapeutic options. Surgery not available,*
Crohn's Disease		Crohn's disease, no exacerbation of symptoms > 5 years, with CT scan or small bowel imaging within past 6 months indicating no current active	Crohn's disease with exacerbation < 5 years, or with an abnormal CT or other radiological imaging suggesting active disease, significant lumen narrowing,	*Risk of recurrence, limited diagnostic and therapeutic options* *CT scanning not available.*
Anal Fissure Anal fistula	Anal fissure, abscess and/or fistula, resolved > 3 months prior to deployment, with no underlying illness contributing to the etiology of the condition.		Current anal fissure, fistula or abscess or occurring < 3 months prior to deployment	*Risk of recurrence, limited diagnostic and therapeutic options*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Hemorrhoids	Grade 1,2 and 3 hemorrhoids, symptoms averaging < 1/month, with symptoms lasting < 1 week, and responsive to medical therapy.	Grade 1,2 and 3 hemorrhoids, symptoms averaging > 1/month, or with symptoms lasting > 1 week, and responsive to medical therapy.	Grade 4 hemorrhoids. Hemorrhoids requiring prolonged therapy	*Surgical correction unavailable*
Cholelithiasis		Cholelithiasis, asymptomatic summer only.	Cholelithiasis- winter only South Pole, MCM and Summit Station	*Risk of acute abdomen*
Pancreatic Pseudocyst		Pancreatic pseudocyst, > 2 years prior to deployment, by radiographic imaging < 1 month prior to deployment, and accompanied by a letter of consultation from an	Pancreatic pseudocyst < 2 years duration prior to deployment.	*Risk of recurrence, limited diagnostic and therapeutic options, ultrasound and CT scan unavailable during winter.*
Pancreatitis	Pancreatitis, single episode, > 2 two years prior to deployment, and no current malabsorption, hypertriglyceridemia, gallstone or alcohol abuse	Pancreatitis, single episode, > 1 but < 2 years prior to deployment, and no current malabsorption, hypertriglycerid-emia, gallstone or alcohol abuse	Chronic pancreatitis. Acute pancreatitis, occurring < 1 year prior to deployment	*Risk of recurrence, limited diagnostic and therapeutic options. No surgical options for pseudocyst during winter.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Laparoscopic Abdominal Surgery	Laparoscopic abdominal surgery, including appendectomy, cholecystectomy, inguinal hernia, ventral hernia, or hiatal hernia >4 weeks prior to deployment, with		History of laparoscopic abdominal surgery < 4 weeks prior to deployment.	*Risk of post-op complications*
Open Abdominal Surgery	Open abdominal surgery, including appendectomy, cholecystectomy, inguinal hernia, ventral hernia, hiatal hernia > 3 months duration prior to deployment without inter- vening		History of open abdominal surgery < 6 weeks prior to deployment. History of multiple abdominal surgeries, complicated surgeries e.g. roux-n-y or	*Risk of post-op complications.* *Increases risk of obstruction. Not waiverable for*
	Acute hepatitis A or B, with serological evidence of resolution, and no clinical symptoms	Chronic hepatitis B or C, with radiographical and/or pathological evidence of absence of cirrhosis, no portal hypertension or systemic	Hepatitis B or C, with associated cirrhosis, portal hypertension, LFTS > 3X normal, hepatoma, concomitant HIV infection or systemic manifestations of disease	*Risk of systemic complications, limited diagnostic and therapeutic options. Applicants need evidence they have been offered*
Body Mass Index (BMI)	BMI less than 40	BMI less than 40	BMI 40 or above	*Obesity affects many aspects of health. CDC states BMI over 25 is overweight; 30 and above is obese;40 or higher is severe obesity.*

Genitourinary

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
General Genitourinary Surgery	Genitourinary surgery, including TURP, or orchiectomy, performed at least 6 weeks prior to deployment, with no complications, and letter of medical clearance from surgeon.		Any genitourinary surgery less than 6 weeks prior to deployment. Urinary tract diversion, urinary catheter, stent, either temporary or permanent.	*Most post operative complications appear prior to 6 weeks.* *Lack of medical expertise*
Benign Scrotal Conditions	Asymptomatic hydrocoele, varicocoele or spermatocoele.		Symptomatic hydrocoele, varicocoele or spermatocoele.	*Standard practice to repair symptomatic scrotal lesions.*
Urinary Stress Incontinence **Cystocoele**		Cystocele, asymptomatic.	Urinary fistula. Symptomatic cystocele.	*Can be surgically repaired prior to deployment*
Urethral Strictures	Urethral stricture, last occurrence > 5 years prior to deployment	Urethral stricture, occurrence >1 but < 5 years prior to deployment.	Urethral stricture < 1 year prior to deployment.	*Risk of recurrence, no surgical options available.*
Urinary Tract Infections	Male, with no more than 1 or female with no more than two infections in past 2 yrs	Male, with >1 or female with >2 recurrent urinary tract infections in the past two year period, with normal urological evaluation and LOS.	Chronic pyelonephritis. Male with evidence of UTI on UA With negative workup for underlying predisposing conditions	*Laboratory C&S available for limited number of organisms, technical inexperience.* *Male pyuria warrants evaluation.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Testicular Cancer	History of seminoma or teratocarcinoma of testes, surgical excision > 5 years prior to deploy-ment, with no evidence of recurrent or metastatic disease, normal chest x-ray, normal tumor markers and letter of clearance from attending physician. History of nonseminoma or nonteratoma carcinoma of testes, surgical excision > 5 years prior to deployment, with no evidence of recurrent or metastatic disease, normal chest x-ray, normal tumor markers and letter of clearance from attending physician.	Seminoma or teratocarcinoma of testes, surgical resection > 3 months but < 5 years prior to deployment, with no evidence of recurrent or metastatic disease, as documented by tumor markers, radiological findings, and confirmatory letter from attending physician. Nonseminoma or nonteratoma carcinoma of testes, surgical resection > 6 months but < 5 years prior to deployment, with no evidence of recurrent or metastatic disease, as documented by tumor markers, radiological findings, and confirmatory letter from attending physician.	Seminoma or teratocarcinoma of testes, surgical resection < 3 months prior to deployment, or with no evidence of recurrent or metastatic disease, as documented by tumor markers, radiological findings. Nonseminoma or nonteratoma carcinoma of testes, surgical resection < 6 months prior to deployment or with evidence of recurrent or metastatic disease, as documented by tumor markers or radiological findings.	*Risk of recurrence, diagnostic monitoring limited, no CT or ultrasound in Antarctica.* *Cannot do assays for tumor markers* *No surgery in Antarctica or evacuation to New Zealand or Chile during winter.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Benign Prostatic Hypertrophy	Benign prostatic hypertrophy, with PSA < 4.0, no nodules on prostate examination, no more than 2 episodes of nocturia per evening.	Benign prostatic hypertrophy, with PSA 4.0-10.0, no nodules on prostate examination, normal ultrasound, no more than 3 episodes of nocturia, and confirmatory letter from attending physician.	Benign prostatic hypertrophy, with PSA > 10.0, or prostate nodule, or abnormal prostate ultrasound, nocturia greater or equal to four episodes per evening.	*PSA can not be tested in Antarctica.* *Medical treatments are available for BPH.* *Ultrasound not available.* *Biopsy capability not available.*
Prostate Cancer	Prostate cancer > 10 years with no evidence of recurrent or metastatic disease, as documented by normal PSA, CT and pathology report of tumor free surgical margins, letter from physician.	Prostate cancer, localized, with no evidence of recurrent or metastatic disease as documented by normal PSA duration >1 and < 10 yrs prior to deployment	Cancer of the prostate, diagnosed < 1 year prior to deployment, or with a rising PSA, or with any evidence suggestive of recurrence or metastasis.	
Bladder Cancer	Cancer of bladder, with no recurrences duration > 10 years prior to deployment, with clearance letter from urologist,	Cancer of bladder, with no recurrence, >2 and < 10 yrs prior to deployment, with LOS letter from urologist.	Cancer of bladder, diagnosed < 2 years prior to deployment.	*Diagnostic equipment, therapeutic options unavailable*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Kidney Cancer	Adenocarcinoma of kidney, with surgical nephrectomy > 10 years to deployment, with no evidence of recurrent or metastatic disease, as documented by radiological findings. normal renal function, and confirmatory letter from attending physician.	Adenocarcinoma of kidney, with surgical neph-rectomy >2 and < 10 years prior to deployment, with no evidence of recurrent or metastatic disease, as documented by radiological findings. normal renal function, and confirmatory letter from attending physician.	Adenocarcinoma of the kidney, diagnosed < 2 years prior to deployment.	*Risk of recurrence, no CT scanning available in Antarctica, evacuation for diagnostic testing unfeasible in winter.*
Nephrectomy	History of nephrectomy, due to obstruction, donation or other nonmalignant etiology, duration > 6 months prior to deployment, with normal renal function.	History of nephrectomy, due to obstruction, donation or other nonmalignant etiology, duration > 2 but < 6 months prior to deployment, with normal renal function.	Unilateral nephrectomy with abnormal renal function.	

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Chronic Renal Diseases		Chronic Glomerulonephritis with normal renal function. Chronic nephritis with Creatinine < 2.0 mg/dl, urine albumin/creatinine < 90	Abnormal renal function, with Creatinine > 2.0 or urine albumin/creatinine > 90 Acute or chronic progressive glomerulo-nephritis. Acute or chronic progressive nephritis	*Chronic renal failure commonly requires intensive monitoring and medical expertise not uniformly available in Antarctica. CT and vascular imaging available off continent during the summer season.*
Autosomal Dominant Polycystic Kidney Disease (ADPKD)	No disease	Blood pressure well controlled (<110/75, ages 18-50, <130/80, above age 50) and eGFR > 60 with letter of support from Nephrologist, AND CT/MRA brain without evidence of aneurysm within 5 years AND TTE without evidence of aortic aneurysm or clinically significant valvular disease within 5 years;	Blood pressure poorly controlled, OR aneurysm (any), OR eGFR<60, Or abnormal renal function, hematuria, renal stones	*Further diagnostic testing indicated. Waiver for aneurysm depends on size, progression and BP control, may require reassessment in less than 5 years as clinically indicated*

Genecology

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Pregnancy			Current pregnancy	*Pregnancy cannot be safely managed at any station*
Post-Pregnancy Termination	Elective and non-elective termination of pregnancy will be evaluated on a case by case basis.	Elective and non-elective termination of pregnancy will be evaluated on a case by case basis.	Elective and non-elective termination of pregnancy will be evaluated on a case by case basis.	*Treatment usually uncomplicated.*
Contraception	Contraception by hormonal manipulation, with no evidence of complications, duration > 3 three months prior to deployment.	Contraception by hormonal manipulation, with no evidence of complications, duration < 3 months prior to deployment.	Contraception by hormonal manipulation, with evidence of persistent abnormal menses.	*Abnormal menstrual bleeding requires evaluation, D&C beyond skill level of most primary care physicians.*
Tubal Ligation	Tubal ligation, uncomplicated, >6 weeks prior to deployment.	Tubal ligation, uncomplicated, >2 and <6 weeks prior to deployment. With LOS from surgeon	Tubal ligation, complicated, or <2 weeks prior to deployment.	
Cervical Dysplasia	History of cervical dysplasia, treated or untreated, with normal pap smear occurring > 3 months prior to deployment. Abnormal pap due to nonspecific inflammation or squamous metaplasia and HPV negative, follow-up recommended in 1 yr.	Abnormal pap due to nonspecific inflammation or squamous metaplasia and HPV negative, follow-up recommended > 6 mos.	Abnormal pap smear with follow-up evaluation recommended within a duration of < 6 months.	*Recently treated cervical dysplasia offers low risk of imminent health hazard.* *Analysis of Pap smear is not feasible during winter season.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Hysterectomy	Hysterectomy, any cause, duration >12 weeks prior to deployment, with negative biopsy results and with letter of clearance from surgeon.		Hysterectomy, any cause, duration <12 weeks prior to deployment	*Major surgical procedures are assigned a six week period of convalescence prior to clearance.*
Endometriosis	Endometriosis, with mild symptoms controlled with hormonal therapy, OTC or NSAID medications, and no surgical procedure occurring < 6 weeks prior to deployment.	Endometriosis, with moderate symptoms controlled with hormonal therapy, OTC or NSAID medications, and no surgical procedure occurring > 6 weeks prior to deployment.	Endometriosis, with moderate to severe symptoms, with or without hormonal therapy, OTC or NSAID medications, or requiring other forms of pain control, or requiring a surgical procedure < 6 weeks prior to deployment.	*Potentially debilitating, laparoscopic surgery cannot be performed in Antarctica.*
Cysts and Abscesses	Bartholin gland or other abscess, single episode, S/P I&D > 6 weeks prior to deployment.	Bartholin gland or other abscess, multiple recurrences, S/P I&D >2 and <6 weeks prior to deployment.	Bartholin gland or other abscess, persistent or chronic, or S/P I&D < 2 weeks prior to deployment.	*Chronic infections tend to persist in Antarctic climate. Limited pharmaceutical resources.*
Pelvic Inflammatory disease	PID, acute episode, resolved > 3 months prior to deployment.	PID, acute episode, resolved > 1 but < 3 months prior to deployment	PID, persistent or recurrent, or resolved < 1 month prior to deployment.	*Only chronic PID offers diagnostic and therapeutic challenges*
Vaginitis	Vaginitis, episodic, responsive to antimicrobial therapy.	Vaginitis, persistent, responsive to antimicrobial therapy.	Vaginitis, chronic, unresponsive to antimicrobial therapy	*Limited lab capability to diagnose complex vaginal infections.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Oophorectomy	History of oophorectomy, benign etiology, > 6 weeks prior to deployment.		History of oophorectomy, < 6 weeks prior to deployment.	
Menorrhea Menorrhagia	History of menorrhea or menorrhagia, resolved, > 1 year prior to deployment without medical therapy, or > 6 months with medical therapy.	History of menorrhea or menorrhagia, resolved, > 6 months but < 1 year prior to deployment without medical therapy, or > 3 but < 6 months with medical therapy.	History of menorrhea or menorrhagia, recurrent or resolved, < 6 months prior to deployment without medical therapy, or < 3 months with medical therapy.	*Condition generally well controlled with hormonal therapy.* *Hysterectomy not feasible during winter season in Antarctica.*
Premenstrual Syndrome	PMS, mild, controlled with medical or dietary therapy not including tranquilizers, antidepressants or counseling	PMS, moderate, controlled with medical or dietary therapy antidepressants or counseling	PMS, moderate to severe, controlled with medical or dietary therapy including tranquilizers, antidepressants or counseling.	*Psychological risk factor, symptoms of depression are more prevalent during seasons of darkness.*
Polycystic Ovary Disease	PCOD, symptoms controlled with hormonal therapy, > 6 months prior to deployment.	PCOD, symptoms controlled with hormonal therapy, > 3 but < 6 months prior to deployment.	PCOD, symptoms uncontrolled, or controlled with hormonal therapy, < 3 months prior to deployment.	*Generally well controlled with therapeutic intervention*
Uterine Fibroids	Uterine fibroids, with normal menses, and no clinical symptoms of pain.	Uterine fibroids, with normal menses, and minimal clinical symptoms of pain, controlled with hormonal, OTC or NSAID therapy.	Uterine fibroids, with abnormal menses, or clinical symptoms of moderate to severe pain.	*Treatment of symptomatic uterine fibroids is hysterectomy, procedure unavailable during winter season.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Uterine Cancer	Cancer of uterus, > 5 years prior to hysterectomy, with no evidence of recurrence or metastatic disease.	Cancer of uterus, > 1 but < 5 years prior to hysterec- tomy, with no evidence of recurrence or metastatic disease.	Cancer of uterus, < 1 year prior to hysterectomy, or with evidence of recurrence or metastatic disease.	*Ultrasound, CT and nuclear medicine not available in Antarctica.*
Ovarian Cancer	Cancer of the ovary, duration > 5 years prior to deployment, with laparoscopic, serological, pathological and radiographical evidence of no recurrent or metastatic disease.	Cancer of the ovary, > 3 but < 5 years prior to deployment, with no serological, pathological and radiographical evidence of recurrent or metastatic disease.	Cancer of the ovary, < 3 years prior to deployment, or with evidence of recurrent or metastatic disease.	*High risk of recurrence, ultrasound, CT and laparoscopic surgery unavailable in Antarctica.*

Hematology

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Iron Deficiency Anemia	Iron deficiency, with etiology of low iron determined, Hct > 35 and responsive to iron supplementation	Iron deficiency with etiology of low iron determined, Hct > 30 but <35, and responsive to dietary or iron replacement therapy.	Iron deficiency with etiology of low iron undeter- mined, or Hct < 30, or unrespon- sive to iron supplementation.	*Unexplained iron deficiency requires diagnostic evaluation High altitude at South Pole exacerbates symptoms of anemia.*
Hemoglobino -pathy	Hemoglobino- pathy trait, asymptomatic and Hct > 35.	Sickle cell or hemoglobin C trait, no history of symptoms, and Hct > 35.	Hemoglobino- pathy, including Sickle cell or hemoglobin C with history of symptoms, or with Hct < 35.	*High altitude at South Pole exacerbates symptoms of anemia. Infection can trigger sickle cell crises.*
Spherocytosis Elliptocytosis	Spherocytosis or Elliptocytosis, single event, > 2 years prior to deployment.	Spherocytosis or Elliptocytosis, single event, duration > 1 but < 2 yrs prior to deployment.	Spherocytosis or Elliptocytosis, multiple events, or < 1 year prior to deployment.	*Risk of recur- rence, can be exacerbated by environmental stressors.*
Megaloblastic Anemia	Megaloblastic anemia, etiology determined, asymptomatic, under treatment > 1 year, with normalization of blood indices and no clinical symptoms.	Megaloblastic anemia, etiology determined, asymptomatic, under treatment for > 3 months but < 1 year, with normalization of blood indices and no clinical symptoms.	Megaloblastic anemia, etiology undetermined. Megaloblastic anemia under treatment for duration < 3 months, or with abnormal blood indices.	*Etiology requires identification.* *Usually respon- sive to therapy*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Autoimmune Hemolytic Anemia		History of auto-immune hemolytic anemia, single episode, resolved > 1 year prior to deployment.	History of auto-immune hemolytic anemia, single or recurrent episode, or occurring < 1 year prior to deployment.	*Risk of recurrence* *Only source of blood transfusion is via a limited walking blood bank*
Idiopathic Thrombocyto-penia Purpura	ITP, single episode, resolved > 10 years prior to deployment.	ITP, single epi-sode, resolved > 2 and < 10 years prior to deployment. Chronic stable ITP, platelet count > 50,000.	ITP, multiple episodes, or < 2 years prior to deployment. ITP, platelet count < 50,000.	*Risk of recur- rence, only source of platelets is via a limited walking blood bank.*
Lymphoma	Hodgkin's disease, Stage IA, S/P radiation therapy, with no evidence of recurrent or metastatic disease, > 5 years prior to deployment.	Hodgkin's or non-Hodgkin's disease, not stage 1A, treated, with no evidence of recurrent or metastatic disease > 5 years prior to deployment;	Hodgkin's or non-Hodgkin's disease, not stage 1A, treated < 5 years prior to deployment, Hodgkin's or non-Hodgkin's, stage 1A treated < 1 yr. prior to deployment. Recurrent lymphoma.	*Stage 1A Hodgkin's has low risk of recurrence* *Stage 1 A lymphoma is curable.* *Increased risk of leukemia with chemotherapy* *Lymphomas frequently recur*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Myeloproliferative Disorders	Acute leukemia, with biopsy proven normal bone marrow, and duration of disease free status following medical therapy > 10 years prior to deployment.	Acute leukemia, with biopsy proven normal bone marrow, and duration of disease free status following medical therapy > 5 and < 10 years prior to deployment.	Acute or chronic Myeloproliferative disorder, including polycythemia, multiple myeloma, non-Hodgkin's lymphoma, or myelodysplasia disorders, or treated with medical therapy < 5 years prior to deployment, or with history of recurrence.	*High risk of recurrent disease*
Splenectomy	History of traumatic splenectomy, with no underlying medical illness or non-traumatic splenectomy (with underlying illness resolved); surgery > 2 years prior to deployment; no history of fulminant bacteremia; Meet CDC vaccine recommendations – fully vaccinated.	Fully vaccinated: Note CDC recommended vaccines are: flu, Tap, Hib, Zoster (<50), MMR (if not immune), both pneumococcal conjugate (PCV13, 15, 20) and polysaccharide (PPSV23) vaccines, both meningococcal conjugate (MenACWY) and serogroup B (Men B) vaccines	History of traumatic splenectomy, with no underlying medical illness or non-traumatic splenectomy with underlying medical illness, surgery < 2 years prior to deployment. History of fulminant bacteremia or underlying medical condition not resolved resolved. or not fully vaccinated.	*The underlying medical condition must be proven to be resolved or stable prior to deployment.*

Infectious Disease

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Tuberculosis	Negative tuberculin skin test or negative Quantiferon test Prior fully treated latent TB. Tmt complete, HIV neg and no evidence of active dx based on annual questionnaire and screening chest x-ray.	History of positive tuberculin skin test or positive quantiferon test without chronic cough or sputum production, and chest x-ray indicating no active tuberculosis .pulmonologist. Must have started treatment for LTBI prior to PQ.	History of positive tuberculin skin test with clinical signs or symptoms of tuberculosis, or chest x-ray indicating active disease, or positive sputum cultures or smears, within 6 months prior to deployment.	*Risk of recurrenc e.* *Unable to perform AFB testing in Antarctica.* *Active TB is a threat to the health of the community. Winter epidemic potentially disastrous.*
Fungal Infections	History of fungal infection, inclu- ding coccidio- domycosis and histoplasmosis, asymptomatic, or resolved with no evidence of active disease > 2 year prior to deployment.	History of fungal infection, inclu- ding coccidio- domycosis and histoplasmosis, asymptomatic, or resolved with no evidence of active disease > 6 months but < 2 years prior to deployment.	History of fungal infection, inclu- ding coccidio- domycosis and histoplasmosis, with evidence of active disease or treated < 6 months prior to deploy- ment.	*Risk of recurrenc e.* *Ability to diagnose specific fungal infections is dependent on lab expertise. No lab technician during winter season.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Lyme Disease	Lyme disease, without cardiac or neurological abnormalities, resolved with no clinical symptoms > 1 year prior to deployment.	Lyme disease, without cardiac or neurological abnormalities, resolved with no clinical symptoms > 6 months but < 1 year prior to deployment.	Lyme disease, treated < 6 months prior to deployment, or with cardiac or neurological abnormalities, or with residual clinical symptoms.	*Risk of recurrence.* *Cannot transport serological sample to certified lab during winter months.*
Chronic Fatigue Syndrome	Chronic fatigue syndrome, resolved with no residual sequelae > 3 years prior to deployment.	Chronic fatigue syndrome, resolved with no residual sequelae > 1 but < 3 years prior to deployment.	Chronic fatigue syndrome, with symptoms occurring < 1 year prior to deployment.	*Risk of relapse, limited therapeutics. Continuous darkness may exacerbate depression during winter season*
Sexually Transmitted Disease	History of treated or under treatment for sexually transmitted disease including syphilis, gonorrhea, chlamydia, and herpes simplex.		History of any sexually transmitted disease, untreated or with systemic complications.	*Usually responsive to course of antimicrobials.* *Unresolved infections require more complex microbial analysis that is not available in Antarctica.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
HIV		HIV infection, with no clinical evidence of AIDS, and with CD4 count > 300, with letter from physician stating prognosis and treatment.	HIV infection, with clinical diagnosis of AIDS, or CD4 count < 300.	*Systemic complications possible, sophisticated diagnostic lab and therapeutic options limited.*
Hepatitis	See GI section	See GI section	See GI section	

Neurology

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Bell's Palsy	Bell's palsy, stable or resolving, > 3 months prior to deployment, with letter from attending physician documenting the condition.	Bell's palsy, stable or resolving, > 1 but < 3 months prior to deployment, with letter from attending physician documenting the condition.	Bell's palsy, stable or resolving, < 1 month prior to deployment, with letter from attending physician documenting the condition.	*Usually benign condition, requires documentation that it is not due to an underlying CNS lesion or represents a complication of an underlying medical condition.*
CNS Vascular Abnormalities			Any ventricular shunt. CNS aneurysm or arteriovenous malformation.	*High risk of infection, CVA.* *No CT or MRI or invasive radiology available.*
Headaches	Headaches, with no underlying systemic illness, controlled with self-injections, OTC, NSAID therapy or preventative measures, with normal neurological evaluation, and not requiring narcotics.	Headaches, with no underlying systemic illness, controlled with self-injections, OTC, NSAID therapy or preventative measures, with normal neurological evaluation, and occasionally requiring therapeutic intervention by a physician.	Headaches, with underlying systemic illness, or not controlled with self- injections, OTC, NSAID therapy or preventative measures, or with an abnormal neurological evaluation, or frequently requiring therapeutic intervention by a physician.	*Chronic pain difficult to assess* *Limited diagnostic and therapeutic capacity. No CT or MRI.* *Strong association with depression that can be exacerbated by darkness and isolation of the winter season.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
CNS Malignancy	Malignancy of the Central Nervous System, with no evidence of recur- rence or metastatic disease, as documented by radiological imaging and letter from attending physician, last treated > 5 years prior to deployment.	Malignancy of the Central Nervous System, with no evidence of recur- rence or metastatic disease, as documented by radiological imaging and letter from attending physician, last treated > 2 but < 5 yrs prior to deployment.	Malignancy of the Central Nervous System, with evidence of recur- rence or metastatic disease. Malignancy of the CNS, treated < 2 years prior to deployment.	*Risk of recurrence* *Must be disease free for 5 years prior to winter deployment.* *No MRI or CT available during the winter season.*
Seizure Disorder	Seizure disorder, single episode, last > 5 years prior to deployment, with normal radiological imaging and EEG, and off all anticonvulsant therapy > 2 years prior deployment.	Seizure disorder, single episode, last occurring > 1 year prior to deployment, with normal radiological ima- ging and EEG, and stable on or off anticonvulsant therapy > 1 year prior to deploy- ment. No meds requiring monitoring. With LOS from neurologist.	Seizure disorder, single or multiple episodes, < 1 year prior to deploy- ment, or with abnormal radio- logical imaging or EEG, or requiring adjustments in anticonvulsant therapy < 1 year prior to deploy- ment. No meds requiring monitoring.	*Unable to monitor medication level in Antarctica. Antarctic environment likely does not increase overall risk. Low morbidity and mortality of stable seizure disorder. Acute seizures can be treated at Antarctica medical facilities.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Neuromuscular Disorders		Any neuro- muscular disorder, including multiple sclerosis, parkin- son's disease or muscular dys- trophy, with no progression > 2 years prior to deployment, and exhibiting independent function including ambulation and communication, and not interfering with activities of daily living.	Any neuro- muscular disorder, including multiple sclerosis, parkin- son's disease or muscular dys- trophy, with pro- gression < 2 years prior to deploy- ment, or exhibiting the necessity for equipment inclu- ding that for ambulation or communication, or otherwise affecting activities of daily living.	*No feasible accommodations for disability access*

Ophthalmology

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Visual acuity	Visual acuity of better than 20/40, with or without correction.		Visual acuity with or without correction, of less than 20/40.	*Vision correction is not available at the clinics*
General Eye Conditions	Chalazion, corneal abrasion or ulcer, resolved.		Chalazion, corneal abrasion or ulcer, active.	
Cataract	Cataract, asymptomatic		Cataract, post surgery <12 weeks prior to deployment.	*Surgical convalescence period of 6 weeks.*
Corneal transplant		Corneal transplant, > 1 year, vision stable.	Corneal transplant < 1 year prior to deployment. With LOS from ophthalmologist	*Ophthalmology expertise unavailable during winter.*
Enucleation	Enucleation, traumatic, > 6 weeks prior to deployment.		Enucleation, traumatic, < 6 weeks prior to deployment.	
Malignancy	Malignancy of eye, with no recurrence > 5 years prior to deployment.		Malignancy of eye, initial diagnosis or with recurrence or < 5 years prior to deployment.	*Risk of recurrence, no diagnostics or therapeutics*
Glaucoma	Glaucoma, treated, with intra- ocular pressure < 22 mm/Hg		Glaucoma, treated, with intra- ocular pressure > 22 mm/Hg; or untreated	*Limited expertise, limited pharmaceutical resources.*
Herpes Keratitis	Herpetic keratitis, single episode, duration > 5 years prior to deployment.	Herpetic keratitis, single episode, duration > 2 but < 5 years prior to deployment.	Herpetic keratitis, multiple episodes, or duration < 2 years prior to deployment.	*Risk of recurrence, can require specialty intervention.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Papilledema	Papilledema, single episode, etiology identified, resolved > 6 months prior to deployment.		Papilledema, multiple episodes, etiology unidentified, active or resolved < 6 months prior to deployment.	*Etiology requires evaluation*
Retinal Detachment	Traumatic retinal detachment, traumatic, resolved > 6 months prior to deployment.	Non-traumatic retinal detachment, traumatic, resolved > 6 months prior to deployment.	Retinal detachment, resolved < 6 months prior to deployment.	*Risk of recurrence.* *No ophthalmology expertise available on ice*
Optic Neuritis	Optic neuritis, single episode, etiology identified, resolved > 6 months prior to deployment. LOS from ophthalmo-logist		Optic neuritis, single or multiple episodes, etiology unidentified, active or resolved < 6 months prior to deployment.	*Etiology requires evaluation*
Uveitis	Uveitis, single episode, resolved > 1 year prior to deployment, with no associated systemic disease.	Uveitis, single episode, resolved > 6 months and < 1 year prior to deployment, with no associated systemic disease.	Uveitis, single episode, resolved < 6 months prior to deployment, or with associated systemic disease.	*Risk of recurrence* *No ophthalmology expertise available on ice*

Orthopedics

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Bursitis	Bursitis, single episode, or last treated > 6 months prior to deployment.	Bursitis, multiple episodes, or last treated > 3 and< 6 months prior to deployment.	Bursitis, chronic, or last treated < 3 months prior to deployment.	*High morbidity, can be painful and require surgical intervention that is not available on the ice.*
Fractures	Fractures, resolved > 6 months, no residuals, or < 6 months prior to deployment with orthopedic clearance.		Fractures, unresolved.	*Fractures require specialty follow-up and must patient must be released without restrictions prior to deployment.* *Limited Physical Therapy available at some sites and is seasonally dependent.*
Tendinitis	Tendinitis, asymptomatic for 1 month.	Tendinitis, recur-rent, last episode > 1 month prior to deployment.	Tendinitis, chronic or current.	*Physical therapy is available during the summer season.*
Carpal Tunnel Syndrome	Carpal tunnel syndrome, resolved.	Carpal tunnel syndrome, intermittent or recurrent, mild symptoms, controlled with splints or chronic NSAID therapy.	Carpal tunnel syndrome, moderate to severe symptoms, not well controlled by splinting or requiring more than chronic NSAID therapy	*High morbidity, physical therapy available during summer season only, cannot perform EMG/NCV or surgery in Antarctica.*
Osteoarthritis	Osteoarthritis, episodic, controlled with prn OTC medication.	Osteoarthritis, chronic, controlled with NSAID therapy.	Osteoarthritis, chronic, requiring pain control other than NSAID therapy.	*Limited supply of narcotics in the pharmacy.*
Chondromala cia patella	Chondromalacia patella, mild, controlled with prn OTC medication.	Chondromalacia patella, moderate, controlled with NSAID therapy.	Chondromalacia patella, moderate to severe, requiring more than NSAID to control pain.	*Limited supply of narcotics in the pharmacy. Variable PT available in winter.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Arthroscopic Surgery	Arthroscopic surgery, > 3 mo prior to deploy-ment; Arthroscopic surgery, > 6 wks and < 3 mo duration prior to deployment, note of clearance from surgeon. Complete physical therapy and fully ambulatory.	Arthroscopic surgery, > 2 and < 6 week duration prior to deployment, with note of clearance from surgeon. Physical therapy completed. Fully ambulatory without use of assistive devices.	Arthroscopic surgery, < 2 week duration prior to deployment.	*Full surgical release is typically issued 6 weeks after surgery.* *To deploy must have full function of affected limbs without restriction of movement or use.* *In some situations, use of assistive devices (cane, rigid brace, etc.) waiverable.*
Shoulder Dislocation	Dislocation of shoulder, single occurrence or last occurring > 2 years prior to deployment, or surgically fixated > 6 months prior to deployment.	Dislocation of shoulder, single occurrence > 6 months or multiple occurrences > 1 year prior to deployment.	Dislocation of shoulder, single occurrence < 6 mos., or multiple occurrences < 1 year years prior to deployment. Dislocation of shoulder, surgically fixated < 6 months prior to deployment.	*Risk of chronic morbidity, unstable shoulder joints require surgical intervention not available in Antarctica*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Herniated Nucleus Pulposus **Sciatica** **Cervical Neuritis**	Herniated nucleus pulposus, with no symptoms > 2 year prior to deployment.	Herniated nucleus pulposus, with no symptoms > 1 year, post surgical.	Herniated nucleus pulposus, with symptoms < 2 yr years prior to deployment.	*Risk of recurrence, surgical intervention and MRI not available in Antarctica.* *Most HNP/sciatica can be managed with pain meds, rest, PT and corticosteroids.*
Lumbosacral Strain	Recurrent episodic lumbosacral strain, with no sciatica, controlled with OTC medications.	Recurrent episodic lumbosacral strain, with no sciatica, controlled with chronic NSAID therapy.	Lumbosacral strain, chronic, or with sciatica, requiring more than chronic NSAID therapy.	*High morbidity, MRI and surgical intervention not available in Antarctica.*
Bone Cancer	Bone cancer, > 5 years prior to deployment, with no recurrence, no amputations and no prosthesis.		Bone cancer, < 5 years prior to deployment, with recurrence, or with amputations or prosthesis.	*Risk of recurrence* *Limited disability access, nuclear medicine not available on ice.*
Paget's Disease		Paget's disease, mild symptoms, no fractures.	Paget's disease, symptomatic, or with history of associated fracture.	*Increased incidence of fracture*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Joint Replacement	Must have full use of joint for deployment	History of hip, knee or shoulder replacement > 1 year prior to deployment.	History of hip, knee or shoulder replacement < 1 year prior to deployment.	*Lack of expertise available during winter season.*

Otorhinolaryngology

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Hearing	Hearing deficit, stable with or without hearing aid.		Progressive hearing loss, etiology undetermined.	*Requires evaluation prior to deployment.*
Cholesteatoma		Cholesteatoma, surgically removed > 1 year prior to deployment, with no evidence of recurrence as documented by recent CT scan.	Cholesteatoma, surgically removed < 1 year prior to deployment, or with evidence of recurrence as documented by recent CT scan.	*High risk of recurrence, surgical intervention not available on the ice*
ENT Malignancy	Any ENT malignancy, < 2 cm in diameter occurring at one site, excised > 5 years prior to deployment, no evidence of recurrence.	Any ENT malignancy, > 2 cm but < 4 cm, or with more than one site, excised > 5 years prior to deployment, no evidence of recurrence.	Any ENT malignancy, > 4 cm in diameter or with more than one site, or excised < 5 years prior to deployment, or with evidence of recurrence.	*Limited diagnostic and therapeutic, cannot do laryngoscopy in Antarctica.*
Mastoiditis	Mastoiditis, resolved with surgical or medical therapy, duration > 12 months. prior to deployment.	Mastoiditis, re- solved with surgical or medical therapy, duration > 6 but < 12 months prior to deployment.	Mastoiditis, resolved with surgical or medical therapy, duration < 6 mo. prior to deployment.	*Risk of recurrence, limited pharmaceutical resources in winter.*
Meniere's Disease	Meniere's disease, last episode > 1 year prior to deployment, easily controlled with prn medication.	Meniere's disease, last episode < 1 year prior to deployment, easily controlled with prn medication.	Meniere's disease, last episode < 1 yr. prior to deployment, or requiring systemic therapy to prevent exacerbations.	*Potential of prolonged exacerbations, no surgical options in winter.*
Chronic Otitis Media	Chronic otitis media, with last exacerbation > 1 year prior to deployment.	Chronic otitis media, with last exacerbation > 6 mo .but < 1 yr. prior to deployment.	Chronic otitis media, with last exacerbation < 6 mo prior to deployment.	*Limited pharma-ceutical resources, cannot do sophisticated microbial analysis during winter.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Tympanoplasty Myringotomy	Tympanoplasty or myringotomy, duration >3 mos prior to deployment, with stable hearing.	Tympanoplasty or myringotomy, duration >1 but <3 mos prior to deployment, with stable hearing.	Tympanoplasty or myringotomy, duration < 1 month prior to deployment, or with progressive hearing loss.	*Follow-up limited to clinical eval-uation and sophisticated audio-metric testing during the winter season.*
Tinnitus	Tinnitus, single episode, resolved > 1 year prior to deployment, or continuous, with normal ENT evaluation, requiring no medical therapy. LOS from ENT	Tinnitus, single episode, resolved > 6 months but < 1 year prior to deployment, or continuous, with normal ENT evaluation, requiring no medical therapy.	Tinnitus, multiple episodes, or resolved < 6 months prior to deployment, or continuous, with abnormal ENT evaluation, or requiring medical therapy.	*Limited diagnostics, treatment of progressive tinnitus with hearing loss often requires surgical intervention not available during the winter season.*
Labyrinthitis	Labyrinthitis, determined etiology, resolved for duration of > 6 months prior to deployment.		Labyrinthitis, undetermined etiology, or resolved for duration of < 6 months prior to deployment.	*Potential CNS etiology, no access to MRI or ENG testing during the winter season.*
ENT surgery	Any minor ENT surgery including T&A, nasal polyps, nasal septal revision, benign nodules or cosmetic repairs, duration > 6 weeks prior to deployment.		Any minor ENT surgery including T&A, nasal polyps, nasal septal revision, benign nodules or cosmetic repairs, duration < 6 weeks prior to deployment.	*Surgical procedures require a six week convalescence period prior to full release.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Sinus surgery	Sinus surgery, duration greater than 6 months prior to deployment.		Sinus surgery, duration < 6 months prior to deployment.	*Potential recurrence or complications, limited pharma-ceuticals.*
Sinusitis	Acute or recurrent sinusitis, < 4 exacerbations per year, responsive to antimicrobial therapy.		Chronic sinusitis.	*Limited pharma-ceutical supplies, cannot do sophisticated cultures during winter season.*
Sialolithiasis	Sialolithiasis, resolved surgically or spontaneously, duration > 1 month prior to deployment.		Sialolithiasis, recurrent, or resolved < 1 month prior to deployment.	*Potential surgical intervention is often required, not available in Antarctica.*

Peripheral Vascular Disease

Condition	Unrestricted Clearance	Restricted Clearance –	Not Physically Qualified	Comment
Arteriosclerosis	No evidence of claudication of the extremities, normal peripheral pulses, normal fundoscopic examination, no vascular bruits, venous stasis or other signs or symptoms suggesting peripheral vascular disease.	Clinical signs or symptoms of peripheral vascular disease, with normal testing as documented by vascular ultrasound, Doppler plethysmography, CT angiography, MRA or arteriography.	Absent peripheral pulses. Skin ulcers, past or present, due to arterial or venous insufficiency. Chronic warfarin therapy.	*Limited diagnostic capacity and therapeutic intervention. Cannot do vascular imaging, ultrasound or sophisticated doppler studies. High risk of embolic disease.*
Cerebral Vascular Disease	No clinical signs of previous cerebrovascular accident, arteriosclerosis on fundoscopic examination No clinical symptoms of transient ischemic attacks.	History of transient ischemic attacks, with normal vascular testing, and consultation from a cardiovascular surgeon and neurologist rendering opinions for the likely etiology of the condition. LOS from these physicians	Evidence of arteriosclerosis on vascular testing. History of cerebrovascular accident. Unexplained transient ischemic attacks. Recurrent claudication.	*Limited diagnostic capacity and therapeutic intervention. Cannot do vascular imaging, ultrasound or sophisticated doppler studies. High risk of embolic disease.* *MRI and CT not available in Antarctica.*
Raynaud's Disease			Raynaud's disease.	*Cold weather exacerbates.*

Condition	Unrestricted Clearance	Restricted Clearance –	Not Physically Qualified	Comment
Vascular Surgery		History of angioplasty or vascular surgery, > 6 months prior to deployment, with a normal cardiovascular stress test, LDL < 100 mg/dl and a cholesterol/HDL ratio < 5, no diabetes, hypertension or smoking > 5 years prior to deployment.	History of arterial surgery or angioplasty < 6 months, or with diabetes, LDL Col > 100, Chol/HDL >5, hypertension or smoking cessation < 2 years prior to deployment.	*High risk of recurrent disease, exacerbated by known risk factors.* *No invasive radiology or surgical option available in Antarctica.*
Abdominal Aortic Aneurysm		Abdominal aortic aneurysm, < 4 cm diameter. LOS from treating physician	Abdominal aortic aneurysm, > 4 cm diameter.	*Requires monitoring not available*
Deep Venous Thrombosis **Pulmonary Embolus**		History of single episode of deep venous throm-bosis/PE, with no recurrence, > 1 and < 5 year duration, requiring no anticoagulation > 6 months, and no demonstrated systemic illness suggesting hypercoagulability.	Deep venous thrombosis/PE, > 1 episodes. History of DVT with hypercoagulability.	*Ultrasound, d-dimer available for diagnosis.* *Medication and monitoring available at all clinics*

Pulmonary

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
General	No clinical symptoms or signs of wheezing, chronic cough, nocturnal or paroxysmal dyspnea, orthopnea, chronic obstructive pulmonary disease or edema. Benign CXR findings	Current upper respiratory infection. Chest x-ray abnormality, undiagnosed, stable, with letter from attending physician.	Abnormal chest radiograph suggesting possibility of current or chronic active pulmonary condition. Recurrent pneumonia occurring within one year prior to deployment.	*Etiology of any potentially current or chronic pulmonary abnormality requires evaluation prior to deployment.*
Asthma	History of asthma, requiring no chronic medication, with use of bronchodilators on an as needed basis only, without exacerbations requiring urgent care or nebulizers < 2 years. FEV1=> 80%	History of asthma, requiring no chronic maintenance therapy, with one exacerbation requiring nebulizer treatment < 2 years, with normal radiographic findings and a post-bronchodilator FEV1 >80%. History of asthma, requiring chronic maintenance therapy, with no exacerbations < 2 years requiring nebulizer treatment, with post-bronchodilator FEV1 >80%.	Asthma, with two or more exacerbations requiring nebulizer treatment < 2 years. Asthma, with one exacerbation requiring nebulizer therapy after initiation of chronic maintenance therapy, < 2 years Asthma, with post-bronchodilator FEV1 < 80%.	*Asthma is often induced by cold weather.* *Winter evacuation is not possible.* *Ample supply of nebulizer therapies available on the ice.* *Limited therapeutic options for those patients having acute exacerbations while on chronic maintenance therapy.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
COPD	History of respiratory illness or significant exposure to pulmonary toxins with FVC > 70% predicted, FEV1 greater than 80% predicted value and a normal pulmonary imaging	History of recurrent respiratory illness, as suggested on CXR, with <2 exacerbations in the past two years, on occasional intermittent medical therapy, with FVC > 70% predicted, FEV1/FVC greater than 80% predicted, no evidence of pulmonary nodules or CHF on CXR, no exposure to altitude > 8000 ft..	Chronic respiratory illness, with FVC < 70% predicted, or FEV1/FVC< 80% predicted, or >1 exacerbations in the past 2 years or requiring daily maintenance medical therapy including MDI, nebulizer and steroids. Deployment to location without electricity or availability of power outlets near the bedside	*High risk of exacerbation or infection, prolonged ventilatory support available only at McMurdo. Expertise in managing critically ill patients for prolonged time frames is often beyond the technical skill of the physician.*
Pneumothorax	Traumatic pneumothorax, resolved either spontaneously or with pleurodesis, with no recurrence for duration greater than 6 months.	History of spontaneous pneumothorax, > 1 year duration, with no evidence of COPD on CXR or pulmonary function testing.	History of spontaneous pneumothorax < 1 year duration, or evidence of COPD on CXR or abnormal pulmonary function testing.	*Risk of recurrence with spontaneous pneumothorax due to blebs.* *Chest tube, X-ray is available, expertise often lacking.*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Chronic Pulmonary Disease	A history of sarcoidosis, tuberculosis or other infectious pulmonary disease, with evidence of resolution of symptoms and clinical findings > 1 year prior to deployment and normal pulmonary function testing.		Chronic restrictive lung disease, with FVC < 70% predicted or FEV1/FVC < 80% predicted. Current active pulmonary disease of any etiology, including autoimmune, infectious or neoplastic.	*Risk of recurrence. Low clinical margin of safety for decompensation in patients with existing pulmonary insufficiency. Winter physicians often lack expertise in critical care.*
Obstructive Sleep Apnea		For South Pole and Summit Station Only: OSA, with or without requiring CPAP; if on CPAP, requires LOS from board certified sleep specialist or pulmonologist with sleep experience and compliance report showing>80% usage	WAIVER only with restricted requirements	*High altitude can exacerbate the condition; limited recourse in winter at South Pole.* *Must bring sufficient medical consumables (tubing,etc) for duration*

Substance Use Disorders

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Alcohol Use Disorder	No history of substance use disorders. DUI or DWAI, single episode > 5 years.	History of alcohol use disorder > 2 years duration of stable recovery, with completion of certified rehabilitation program and letter from counselor. (Appendix 2) DUI or DWAI, > 1 but <5 years, isolated event, with note from counselor. DUI or DWAI, 2 events or less, last > 5 years. History of violence related to alcohol, single event, > 5 yrs., no recurrence, with note from counselor.	History of alcohol use disorder < 2 years duration of stable recovery. (Appendix 2) DUI or DWAI, < 1 year, or with pending litigation. More than 2 DUI or DWAI convictions. History of violence related to alcohol, < 5 years prior to deployment.	*Uncontrolled and essentially unrestricted access to alcohol in Antarctica.* *No professional law enforcement is present on the continent.* *No skilled alcohol treatment or counseling program is routinely available.* *Alcoholic Anonymous is available at some stations during some seasons as a resource.*
General Concerns		Unresolved but documented concerns by physician regarding substance use disorders appropriate to the deployment destination.		*No medical evacuation possible during winter*

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
Drugs of Abuse	History of substance use disorder, single episode, > 2 years prior to deployment, with completion of certified rehabilitation program and letter from attending physician.	History of substance use disorder age < 30, single episode, > 1 but < 2 years prior to deployment, with completion of certified rehabilitation program and letter from attending physician. History of substance use disorder age > 30 with incident >3 years prior to deployment.	History of substance use disorder chronic or multiple episodes, or age < 30 with incident < 1 year prior to deployment, or without completion of certified rehabilitation program and letter from attending physician. History of substance use disorder age > 30 with incident < 3 years prior to deployment.	*Individuals older than age 30 are more likely to be habitual rather than experimental users.*

Section 2: Report of Hazard, Unsafe Condition, or Unsafe Practice

1. Purpose and Scope

The processes described in this section provide program participants with a practical means of reporting hazards, unsafe conditions, or unsafe practices encountered while located at a facility or field operations in a geographic area supported by the Office of Polar Programs (OPP).

2. General Requirements

2.1. The Occupational Safety and Health Act of 1970 gives an employee assurance that no discriminatory or discharge action will be taken against any employee who exercises their rights under the Act. NO retribution shall be taken towards any employee or researcher that reports an unmitigated hazard, unsafe condition, or unsafe practice.

2.2. If OPP becomes aware of any such retribution, the Contracting Officer or OPP will investigate and implement corrective actions by all available means.

2.3. If a participant reasonably believes working conditions are unsafe or unhealthful, they have the right, the responsibility, and the authority to **STOP** such work activity.

2.4. All employees, grantees, or guests are encouraged to speak up when an unsafe condition or practice is observed. The participant noticing the condition should notify the affected personnel and the responsible supervisor (or relevant leadership) immediately to remove any on at risk of harm.

2.5. The supervisor and the affected personnel shall investigate the cause for intervention. If the unsafe concern/condition cannot be immediately resolved, or the supervisor does not adequately address the safety concern, the participant, supervisor, or relevant leadership shall contact the Contractor's Safety Office (CSO) for assistance.

2.6. The CSO shall be informed of the concern and details regarding any action or non-action taken to correct the issue. If the CSO takes no action, or the safety concern was not adequately addressed, the concerned individual should notify the appropriate NSF Manager for the geographic area of concern.

3. File a Complaint.

Any participant who believes working conditions are unsafe or unhealthful, may file a confidential complaint with NSF OPP Safety Officer directly by email at **oppsafety@ nsf.gov**.

Section 3: Risk Management, Hazard Control Plans & Analysis

1. Purpose and Scope

The processes described in this section help program participants avoid or control hazards connected to common work activities and the list of High-Risk activities that Office of Polar Programs identifies as having potential for increased threat to employee safety, property loss, and/or mission accomplishment.

Exception: Activities or duties in direct support of DoD aircraft maintenance and operations shall conform with the applicable DoD regulations, USAF instructions, and Unit procedures.

For work involved in construction or dismantling, demolition or removal of improvements, the Contractor shall comply with all pertinent provisions of the latest version of U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1.

Note: Prime contractors (PC) and principal investigators (PI) retain full responsibility for their sub-contractors, personnel, and project activities.

2. General Requirements

Planning is essential to anticipate emerging hazards during all program activities. Contractors and other program partners are accountable for developing comprehensive risk management plans that identify and analyze program activities in all areas and functions, including but not limited to operations and maintenance, construction, engineering, planning, research, and other inherent risks. This evaluation shall include the assignment of roles and responsivities, preventive measures, and monitoring activities.

Protecting staff safety and health, limiting property damage, and avoiding program interruptions is a collective effort. To effectively control and prevent these hazards from impacting staff and mission, program participants must identify opportunities for controlling risk using a "hierarchy of controls." Controls must protect staff from workplace hazards and avoid incidents or significant impact to mission achievement.

In addition to compliance with 29 CFR 1910 and 1926, specifications for all OPP activities and contract work shall include additional requirements that ensure a high standard of physical protection and safety performance by those performing activities within the geographic area supported by OPP.

3. Hazard Control Plans

3.1. High-Risk Activities

To manage high-risk activities, OPP requires a Hazard Control Plan (HCP). A HCP describes how the selected controls will be implemented and monitored. These plans are necessary to ensure that sufficient planning and control management is applied where OPP-supported activities place personnel and property at high-risk. An effective plan will address serious hazards to ensure successful control of the identified risks.

3.1.1. Hazard Control Plan (HCP)

- Before performing any activities included in the High-Risk Activities list or deemed high-risk through other internal reviews/assessments, the responsible authority (Prime Contractor or Principal Investigator) shall develop an HCP. This process ensures that there is genuinely no safe alternative way to accomplish the work other than the proposed method.
- The responsible authority shall submit a HCP and corresponding plans and procedures to OPP Safety and Occupational Health (SOH) team and relevant COR, Activity Based Manager (ABM), and/or Program Officer/Manager for review no less than 21 days preceding the planned activities. The OPP will allow for exceptions only in extreme situations or emergencies. The OPP SOH will review and return initial comments or acceptance within 14 days of receipt. WARNING: Physical operations or activities in these areas cannot begin until the plan is found acceptable by OPP.
- During the planning process for high-risk activities, the PC shall develop an HCP. This plan shall interface with the contractor's overall safety and health program. Yet, it shall remain an activity or project-specific safety and health plan integrated into the planning process.
- During the planning process for high-risk activities, the PI shall develop an HCP. This plan shall interface with the PC's and home institutions' overall safety and health program. Yet, it shall remain an activity or project-specific safety and health plan integrated into the planning process.

3.1.2. Minimum Basic Outline for a Hazard Control Plan

- The HCP shall clearly and specifically outline the scope, purpose, authorization, roles, responsibilities, rules, and techniques to control the hazardous condition. Submitters should not copy relevant OSHA standard(s) word for word; instead, they must provide precise details on how they plan to implement the standards and requirements necessary to complete the activity.
- At a minimum, the HCP shall address the following:
    - Provide the name, title, signature, and phone number of the plan preparer, including qualifications and experience.
    - Include the name and signature of those responsible for the activity and safety.
    - Include a description of the work, the activities and phases, the anticipated duration (start and end dates), and the specific location(s) (include a map).
    - The plan preparer shall justify why work cannot be safely performed in any other fashion. Provide other possibilities considered and why they would not work. "It's just always been done this way" is not an acceptable reason.
    - Describe work practices to be followed; furnish details of the activity and associated hazards and how those hazards will be controlled and managed. Clearly identify who is doing what, when, where, and how, and what equipment is necessary.
    - Describe the job briefing details (method, who, what, when, and where).
    - Provide emergency response plans, with verification/concurrence from the emergency response team(s); include emergency contact information and scheduled drills to test this plan, if applicable.
    - Give a list of any coordination completed or required with other agencies or organizations; include points of contacts for each, and briefly describe safety coordination efforts executed.

- Include detailed task-specific hazards and controls for each definable activity, formatted equivalent to a Hazard Analysis tool utilized to complete the planning process described in the Contractor Risk Management Process (below).

3.1.3. List of High-Risk Activities

- Activities include but are not limited to:
  - Excavations five feet in depth and greater or at any depth where there is an unsafe physical condition or hazardous atmosphere.
  - Work at heights greater than 20 feet or where work must be performed from any height over dangerous equipment, a hazardous environment, or an impalement hazard.
  - Energized work or operations adjacent to energized equipment, lines, and substations.
  - Critical lifts, hoisting of personnel, hazardous materials (e.g., explosives, highly volatile substances), or submerged loads. Lifts made with more than one crane, or from a blind location, or when loads exceed 75% of the total capacity of load handling equipment's rated capacity, in any configuration.
  - McMurdo cargo and fuel off-load, to include shooting lines or other similarly high-risk activities
  - Possible overexposure to a hazardous chemical or biological substance (refence the most conservative measure i.e., ACGIH TLVs or OSHA PELs)
  - Work that creates or expands snow or earth tunnels.
  - Activities with a potential danger of drowning when working at or near the sea ice edge or on ice floes.
  - Work with ionizing radiation.
  - Diving Operations (reference Section 19).
  - Assembling or dismantling prefabricated components (10 tons or greater).
  - When conducting blasting operations.
  - Complex confined space work or when multiple permits are required.
  - Activities in, or traveling through, crevassed zones.
  - Other similarly high-risk activities that may cause increased risk to life safety and health as determined by relevant stakeholders and/or the OPP SOH Staff, reference paragraph 3.1.4.
- For questions or matters of interpretation relevant to this list of High-Risk Activates contact the OPP SOH Staff at opp-safety@nsf.gov

3.1.4. Decision-Making Process for Hazard Control Plans.

- Outside of those listed as mandatory in the OPP Safety Policy, other triggers that lead to OPP's request for HPC's include:
  - Any highly complex work or when multiple organizations, groups, or activities are necessary to accomplish a task.
  - Uncertainty in key inputs (Low Confidence).
  - Diversity of knowledge, skills, and abilities of stakeholders.
  - Possibility of high financial stakes or serious program interruptions.
  - Historical incidents of near miss, injury, or equipment issues.

3.2. Contractor Risk Management Process

3.2.1. Before commencement of each work activity, task, or feature of work, the responsible authority shall prepare a documented Hazard Analysis.

3.2.2. Risk management is a business process that includes identifying, assessing, and prioritizing risks to an acceptable level by the coordinated application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events.

3.2.3. Within each significant phase of work (activities, tasks, or definable work features), there will be risk that requires a hazard analysis. The Prime Contractor shall identify significant phases of work that will be performed due to the activities of their contract and complete a hazard analysis for each.

3.2.4. Contractors and other employers typically use Job Safety Analysis (JSAs), Job Hazard Analysis (JHAs), Activity Hazard Analysis (AHAs), or similar Risk Management assessment tools. These documents are considered equivalent. The selected tool shall include:

- Define the steps performed within the activity, task, or defined feature of work (DFOW), identify the work sequences, specific anticipated hazards, site conditions, equipment, materials, personnel, and the controls measures to be implemented.
- Names of the Competent Person(s) and Qualified Person(s) required for a particular activity shall be identified, including proof of their competency/qualification (examples activities include; excavation, scaffolding, fall protection, and others specified by this policy or OSHA).
- An evaluation of the residual risk, risk remaining after controls have been applied for each work sequence.

3.2.5. Risk Acceptance

- Activities determined as High Risk or greater shall be forwarded to the OPP SOH as described in the Hazard Control Plan described in this section (above), include a copy of the Hazard Analysis with all related plans when forwarding the submission.
- Plans shall include an acceptance (at an appropriate management level) for the residual risk.
- Properly communicate the potential hazards to each employee involved.

3.2.6. Once the activity has been completed, the hazard analysis shall be available and kept on file at the site for a minimum of 6 months.

3.3. Construction Safety and Occupational Health Plan

3.3.1. Before initiation of work at the project site, a Construction Safety and Occupational Health Plan shall be developed and submitted for review and found acceptable by the OPP SOH Officer. This plan shall address any unusual or unique aspects of the project or activity.

3.3.2. Construction SOH plans shall be developed and submitted by the Prime Contractor. The Contractor shall address each of the elements/sub-elements, in the outline provided in this section in the order that they are provided. If an item is not applicable because of the nature of the work to be performed, the Contractor shall state this exception and provide a justification.

3.3.3. Construction SOH plans shall contain appropriate hazard-specific plans as needed for the work being performed and include a list of each major phase of work that will be performed. They shall also complete a Job Hazard Analysis prior to each activity as outlined in paragraph 3.2.4 above.

3.3.4. At the time of submission, if portions of the work have yet to be known or sub-contracted, the Contractor will add the appropriate revisions to the plan and submit for acceptance by the OPP SOH before initiating the additional work.

3.4. Minimum Basic Outline for a Construction Safety and Occupational Health Plan

- Signature Sheet: Include title, signature, and phone number of the following:
- Plan preparer (include qualifications).
- Plan concurrence (e.g., Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional, project QC).
- Background Information:
    - Contractor.
    - Project Name.
- Brief project description, description of work to be performed, location (include a map or site plan, equipment to be used, anticipated high risk activities, and major phases of work anticipated.
- Statement of Safety and Health Policy.
- Responsibilities and Lines of Authority.
- A statement of the Contractor's ultimate responsibility for the implementation of the Safety and Occupational Health program.
- Identification and accountability of personnel responsible for safety at both corporate and project level, including lines of authority.
- Provide written company procedures for holding manager and supervisors accountable for safety.
- Include policies and procedures regarding employee non-compliance with safety requirements.
- Names of Competent and/or Qualified persons (CP/QP), include proof of current and active competency/qualifications to meet OSHA CP/QP requirements.
- Identify subcontractors and suppliers. If this is not known at the time of initial submittal, the contractor shall include the following statement in their initial plan: "The subcontractors for the following DFOWs/activities are not known at this time, additional information will be submitted to the plan for acceptance by NSF prior to the start of any activities listed." The Prime Contractor shall ensure that any adjustments/substitutions to the accepted slate of qualified personnel are provided to NSF for acceptance to the start of any activities listed.
- Procedures for periodic safety and health Training for Supervisors and Employees.
    - Requirements for new hire SOH orientation.
    - Mandatory training and current certifications that are applicable to expected situations on the project e.g., explosive actuated tools, confined space entry, crane operator, underwater diver, vehicle operator, HAZWOPER training and certification, PPE, etc.) and any requirements for periodic retraining/recertification.
    - Emergency response.
- Safety and Health Inspections.
- Specific assignment of responsibilities for a minimum daily jobsite SOH inspection during periods of work activity: Who will conduct (e.g., Site Safety Professional, PM, QC, supervisors, employees – depends on level of technical proficiency needed to perform said inspections), proof of inspector's current training/qualifications, when inspections will be

conducted, procedures for documentation, deficiency tracking system, and follow-up procedures.

- Mishap Reporting and Investigation.
- Mishaps shall be reported as soon as possible, reference section 4, paragraph 4 of this policy for specific instruction.
- The contractor shall report, thoroughly investigate, and analyze all mishaps occurring incidentally to an operation, project, or facility for which this policy is applicable. The contractor shall implement corrective actions as soon as reasonably possible and provide notice to the OPP when corrective actions are complete.
- Plans, Programs and Procedures.
    - Based on a risk assessment of contracted activities and on mandatory OSHA compliance programs, the Contractor shall address all applicable SOH risks and associated compliance plans.
    - The plans shall incorporate project-wide procedures to control hazards to which the employees of all project employers may be exposed.
    - These procedures shall be coordinated with all impacted project participants and shall include project-specific, project-wide emergency response and evacuation procedures, PPE, recordkeeping, reporting, and training requirements.
    - The plans shall be prepared prior to the start of any work activities on the job site (as much as the information can be known at that point in time). The plans shall be updated throughout the life of the project to include changes in personnel, equipment, conditions, etc., and shall be provided to OPP. Additional revisions shall be incorporated as necessary to reflect changing site conditions, construction methods, personnel roles and responsibilities and construction schedules.
        - Fatigue Management Plan
        - Emergency Plans
        - Site Sanitation/Housekeeping
        - Medical Support Agreement
        - Exposure Control Plan
        - Automatic External Defibrillator Program
        - Site Layout Plan
        - Access/Haul Road Plan
        - Hearing Conservation Program
        - Respiratory Protection Plan
        - Health Hazard Control Plan
        - Hazard Communication Program
        - Process Safety Management Program
        - Lead Compliance Plan
        - Asbestos Abatement Plan
        - Radiation Safety Program
        - Abrasive Blasting Procedures
        - Heat Stress Monitoring Plan
        - Cold Stress Monitoring Plan
        - Indoor Air Quality Management
        - Mold Remediation Plan
        - Chromium (VI) Exposure Evaluation

- Lighting Plan for Night Operations
- Traffic Control Plan
- Fire Prevention Plan
- Arc Flash Hazard Analysis
- Hazardous Energy Control Program & Procedures
- Standard Lift Plan – Load Handling Equipment
- Critical Lift Plan – Load Handling Equipment
- Naval Architectural Analysis – Load Handling Equipment (Floating)
- Severe Weather Plan
- Man Overboard/Abandon Ship Procedures
- Float Plan for Launches, Motorboats, and Skiffs
- Fall Protection and Prevention Plan
- Demolition/Renovation Plan
- Rope Access Work Plan
- Excavation/Trenching Plan
- Erection and Removal Plan for Formwork and Shoring
- Precast Concrete Plan
- Lift Slab Plans
- Masonry Bracing Plan
- Steel Erection Plan
- Tower Erection Plan
- Explosive Safety Site Plan
- Blasting Plan
- Dive Operations Plan
- Emergency Management Plan for Diving
- Aircraft/Airfield Construction Safety Plan
- Confined Space Program and Entry Procedures

3.5. Special Instructions

3.5.1. Inspections

- All participating parties shall have available onsite for review, required inspection records, and tests indicating compliance with manufacturer and OSHA requirements for infrastructure, facilities, and other assets (e.g., cranes, fire protection systems).
- Equipment failing to meet requirements must not be used, pending compliance.
- When defects render equipment unsafe, contractors shall provide prompt notification to all impacted parties including relevant Government staff (COR, ABM/PM, and OPP SOH) the specific corrective actions required, and direction to withhold equipment operation until corrections are complete.
- Contractors shall advise the COR, ABM/PM, and OPP SOH of completed actions.

3.5.2. Stop Work Order

- If all attempts to secure voluntary compliance with safety requirements are unsuccessful, the contracting officer (CO) or COR may issue a stop work order.
- The order should only apply to that portion of work affected by the actions or inactions of the contractor; all the facts of the proceedings shall be documented, including uncorrected safety violations.

- The contractor shall be informed in writing of the extent of the work stoppage, include the date and hour work has stopped, provide the reason for the action, and incorporate the conditions under which work may proceed.
- The OPP Safety Officer shall be notified immediately of such action.

3.5.3. Reckless Participants

- The OPP has a zero tolerance for reckless and purposely unsafe behavior or the placement of anyone in a known and imminently unsafe situation where the risk of a serious injury or fatality is great and unmitigated.
- When a contractor, employee, grantee, or other partners purposely endanger their own well-being or the well-being of others by flagrant disregard of known safety standards, the individual or individuals shall be immediately removed from the hazardous condition (if possible) by contractor management and OPP. The Code of Conduct will be utilized to determine the most appropriate response thereafter (See the Polar Code of Conduct, OPP-POL_6000.01).

Section 4: Mishap Reporting and Investigation.

1. Purpose and Scope

1.1. Mishap reporting, investigation, and record-keeping are critical to OPP's safety and health efforts. Determining the cause and identifying the problem areas help us better understand how we can correct hazardous work conditions and broaden the lessons learned to prevent the reoccurrence of similar events in the future.

1.2. A mishap is an unplanned, undesired event occurring during work or activities performed as part of the operations described in this policy. The term "mishap" includes accidents, incidents, and near misses or good catch.

1.3. All mishaps occurring incidentally to an operation, project, facility, or equipment for which this policy is applicable shall be reported, investigated, and analyzed as prescribed in this section.

1.4. This section establishes the requirements for mishap notification, reporting, and investigation within the scope of the OPP's domain; helps to standardize the processes to improve efficiency and helps to ensure all accidents are reported per 29 CFR Part 1904, "Recording and Reporting Occupational Injuries and Illness."

1.5. The OPP Safety and Occupational Health Staff retain the ability to perform or delegate a third party to investigate any mishaps/incidents that occur within the jurisdictional or the geographic areas of OPPs operations.

2. References

- 29 CFR 1904.39, Recording and Reporting Occupational Injuries and Illness.

3. General Requirements

3.1. The reporting and associated investigation of these mishaps is to be used for data collection, data trending and correction of hazards or program deficiencies before they result in an accident. To encourage reporting of these mishaps, for the betterment of all, this data is NOT to be used for any other reason.

3.2. Mishap investigations are not to be used for disciplinary purposes but rather to learn and prevent similar incidents in the future.

3.3. Program participants involved in, or who become aware of, any mishap are responsible for immediate reporting of the occurrence to their employer, supervisor, or other responsible employees.

3.4. Program participants shall report all mishaps and near misses or good catches to relevant on-ice personnel and OPP as soon as they become aware of them. Researchers must also notify the support contractor and responsible government authority for the site they are visiting.

3.5. No supervisor may decline to accept a report of a mishap, near miss or good catch from a subordinate.

3.6. The general recordable criteria for injuries or illnesses are any work-related injury or illness that results in:

- Death, regardless of the time between the injury and death, or the length of the illness.
- Days away from work (any time lost after day of injury/illness onset).
- Work restrictions and/or transfer of duties resulting from any workplace injury/illness.
- Medical treatment beyond first aid.
- Loss of consciousness or a significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in those above.
- In addition to the requirements identified above, contractors are required to report property damage of $5,000 or greater.

4. Mishap Notification Guidelines.

4.1. Contractors shall capture reports from any activity in their control including subcontractor, and grantee activities, and ensure reporting to NSF OPP as outlined in this section.

4.2. Compliance is requested where Department of Defense (DoD) and other program partners have their own reporting and investigation processes.

4.3. Notification Procedures for Serious Mishaps

4.3.1. Any mishap that results in or appears to have, any of the consequences listed below shall be **immediately** reported to the OPP.

- Fatal injury/illness.
- Permanent total disability injury/illness (a complete loss or part of any member of the body or any permanent impairment to functions of the body or part thereof to the extent that the individual cannot follow gainful employment).
- Permanent partial disability injury/illness (a complete loss or part of any member of the body or any permanent impairment of the functions of the body or part thereof).
- Where one (1) or more persons are hospitalized because of a single occurrence.
- Where damage of $500,000 or more to OPP-funded property and/or equipment is possible.
- When a significant event may not result in death, be life-threatening, or cause severe damage to OPP-funded property and/or equipment but may carry the potential for adverse publicity for NSF and/or the program.

4.3.2. Upon being notified of a **Serious Mishap**, the contractor's management staff (on-site) shall immediately inform the OPP representative or station manager and the contractor's safety staff, the OPP Safety Officer, and the OPP program managers or ABM.

- When an OPP representative or station manager is on-site, the contractor's management staff, or worksite supervisor shall immediately notify him/her by telephone or in-person.

- When an OPP representative or station manager is not on-site, the contractor's management staff, or worksite supervisor shall immediately notify him/her by telephone or when immediate contact is not possible by email.
- Additionally, the contractor's representative will send an email to the OPP representative or station manager with the known details (per para 4.5.) within 4 hours of any serious mishap.
- When notified, the contractor's safety office will immediately notify the OPP Safety Officer by phone and email at opp-safety@nsf.gov.

4.4. Notification Procedures for Less Serious Mishaps

4.4.1. Any mishap that results in or appears to have any of the consequences listed below shall be reported to the OPP.

- Any injury requiring medical care beyond First Aid.
- The operation of a vehicle (whether moving or halted) that results in injury, damage to the vehicle appearing to be beyond $5,000 but less than $500,000 (as estimated by vehicle maintenance department staff or by somebody with the requisite knowledge), or damage to any property beyond $5,000 but less than $500,000.
- Damage beyond $5,000 but less than $500,000 to any property, equipment, or material incident to an OPP-supported facility.
- Explosions; fires involving ammunition and other explosives; exposure above exposure limits, to radiogrequancy, LASER or ionizing radiation; chemical exposures; contamination or damage of property from biological, radiological, or chemical agents; crane accidents (no matter how minor); and confined space incidents (no matter how minor).

4.4.2. Upon being notified of a **Less Serious Mishap** the contractor's management staff or contractor's safety office will notify the OPP representative or station manager, the OPP Safety Officer, and the OPP program managers or ABM within 24 hours of any less serious mishap (per para 4.5.).

4.5. Mishap notifications shall include, but not limited to, the following:

- Name of the participant(s) killed or injured, job title, and specific location.
- Identification of property (ownership) and/or equipment damaged, and dollar estimate of damage.
- Date and time of mishap.
- Location of mishap, to include research station and project name.
- Contract number and the name of contractor (and/or sub).
- Description, (who, when, what, why, and how) in as much detail as possible.
- Immediate actions taken to control the hazard to prevent further injuries and/or damage.
- Any other information considered pertinent.

4.6. Except for rescue and emergency measures, the mishap scene shall not be disturbed until it has been released by the investigating official.

5. Procedures for Recordable Mishap and Investigations.

5.1. Contractors shall conduct investigations for serious and less serious mishaps (as defined in para. 4.3 and 4.4 above.

5.1.1. A formal mishap report shall be submitted to OPP SOH no later than 30 calendar days following the incident.

5.1.2. Updates shall be provided to the OPP Safety Officer every seven days that identify immediate actions taken, actions in progress, and overall status of the investigation.

5.1.3. Reports shall include a root-cause analysis (covering both direct and indirect causes), corrective actions to mitigate the risk of similar future incidents (with cost estimates), and a proposed timeline for implementation of corrective actions.

5.1.4. The following signature chain shall be used to ensure review at appropriate levels.

- Lead investigator (if other than the contractor safety manager)
- Contractor safety manager
- Contractor management
- OPP Program Manager or ABM
- NSF OPP Safety Officer

5.2. All **Serious Mishaps** as defined in paragraph 4.3.1. above, unless determined otherwise by the OPP Safety Officer, require a Board of Investigation (BOI) appointed by the OPP Safety Officer with approval by the OPP Director.

5.3. Other incidents not listed above may require a BOI investigation, if determined appropriate or necessary by the OPP Safety Officer with approval by the OPP Director.

5.4. The OPP Safety Officer will manage the BOI process and ensure a complete and accurate investigations.

5.5. In addition to the above, any mishap occurring in any of the following high hazard areas shall be immediately reported. These mishaps shall be investigated in depth to identify the cause(s) and to recommend hazard control measures.

- Electrical – to include Arc Flash, electrical shock, etc.
- Uncontrolled Release of Hazardous Energy (includes electrical and non-electrical).
- Load Handling Equipment (LHE) and/or rigging.
- Fall-from-Height (any level above surface).
- Confined Space.
- Underwater Diving.
- Explosions; fires involving ammunition and other explosives.
- Exposure or suspected exposures, above OSHA permissible limits to radiofrequency, LASER or ionizing radiation.
- Chemical exposures or suspected exposures, above OSHA permissible limits; contamination or damage of property from biological, radiological, or chemical agents.

5.6. Near Misses or a Good Catch, especially where a severe loss could have occurred, should be investigated, and recommendations for prevention developed and implemented to mitigate risk of injury, fatality, or property loss. Reporting of this nature is a positive indicator of a proactive safety culture and symbolizes those personnel truly have internalized the safety process and that leadership is communicating correctly that reporting is to prevent injuries and not for punishment. It is also recommended that the contractor provide periodic roll-up of these occurrences to the governmental program/area managers and OPP safety officer.

5.7. Safeguarding Accident Information: Completed accident investigation reports and any attachments, copies, or extracts will not be appended to or enclosed with any other report or document, unless the sole purpose of the other report or document is to aid in accident prevention. Requests for copies of accident reports from outside OPP will be in writing and forwarded to NSF.

5.8. Accident Reporting Integrity: It shall be the responsibility of on-site managers to take reasonable steps to ensure that all accidents are properly reported. If injuries are mentioned through unofficial discussions, or if local medical clinics receive injuries, they should be reported to the prime contractor's safety office (while protecting personal information) to investigate whether the injury was work-related, as defined by OSHA and this section.

5.9. Criminal Investigations: If there appears to be criminal involvement, criminal investigations will take precedence over a safety investigation. If the two investigations are concurrent, it is vital that the two investigations remain clearly separate, to include BOI members. The purpose of this is to ensure the safety investigation remains a non-punitive process, which results in a more open sharing of information that can help determine causation to prevent future occurrence.

6. Immediate Procedures - Serious Incident

6.1. The first concern at an accident scene, regardless of its seriousness, is care of the injured. Nothing should interfere with this concern except safety of the rescuers themselves.

6.2. Protect others and preserve property.

6.3. Refer to paragraph 4 above for notification procedures, ensure the controlling contractor's safety and health office is promptly notified.

6.4. The controlling contractor and/or an onsite government representative shall immediately secure the accident site to prevent any alteration of the scene prior to the completion of the investigation.

6.1.1. The site should be maintained as much as possible as it was at the time of the accident so that it can be examined by the BOI.

6.1.2. The method used to secure the site will depend on the conditions and circumstances involved. Several methods are:

- Roping off the area using barricade tape, string, or rope.
- Closing a walkway or stairway leading to the area.
- Using staff to prohibit access to the area.

6.1.3. Whatever methods used; the following procedures should be followed:

- Nothing should be removed from the scene without government approval.
- All program participants should be instructed not to touch, move, or mark anything at the accident site unless asked to do so by the BOI Chair.
- An entry point should be provided to control entry and exit.
- A list of authorized persons shall be kept preventing unauthorized access.

6.5. Only after the accident site is safe to approach should the actual investigation begin.

6.6. Recording Physical Evidence for the BOI.

6.6.1. With the approval of the OPP Safety Officer an onsite government representative and/or management from the controlling contractor will promptly collect physical evidence that could be lost to environmental conditions or for the preservation of critical supplies materials, and/or equipment.

6.6.2. Walkthrough of the accident site: Conditions at an accident scene will change rapidly. Take notice of the location of all items of evidence. Record this information as walkthrough is made, video documentation is highly recommended. Mark the location of items likely to be moved (injured people, light weight or high value items, etc.).

6.6.3. Photograph all evidence: Photographs of the general area, major elements of the accident site and articles of evidence should be taken as soon as possible after the accident.

6.6.4. Make a diagram of the accident site: A sketch should be made of the accident scene, showing the location of all evidence essential to understanding the accident situation. Distances involved should be measured and recorded on the sketch. Later, information from the sketch can be used to prepare a scaled diagram for inclusion in the accident report.

6.6.5. Make a list of all potential witnesses: The Board will need to interview all persons who may be able to contribute information about the accident. Develop a list of individuals that witnessed the incident or have knowledge that would aid the investigation. Witnesses may create an individual account to document their recollection of the incident for future submission to the Board. These individual memorandums for record shall be encouraged but not submitted to any individual outside of an appointed BOI member or the OPP Safety Officer.

6.7. All Physical Evidence initially collected following the incident shall be submitted to the appointed Board, the OPP Safety Officer, or other designee.

7. Board of Investigation Procedures

7.1. Appointments

7.1.1. BOI membership shall be based on the background and knowledge needed to conduct a thorough investigation.

7.1.2. The OPP Safety Officer may, at his/her option or at the request of the OPP Director, become involved with the Board of Investigation.

7.2. The OPP Safety Officer or designee and other representatives from OPP shall travel as soon as possible and where practical to the site of all accidents that result in a fatality, taking into consideration travel conditions and environmental hazards.

7.3. The BOI will prepare a written report which should contain details of what happened, when it happened and who was involved. It should develop conclusions regarding the physical cause of the accident but should not deal with the placement of legal liability upon any party.

7.4. Additional information that should be included with the written analysis include photos, sketches, diagrams, and other exhibits essential to presenting a clear picture of the incident. The OPP Safety Office will provide additional guidance with the required elements of the investigation and recommended outline for the written report.

7.5. Three copies of the Board's written report will be submitted to the OPP Safety Officer as soon as practical but no later than 90 days following board formation. Note: In unique circumstances, the deadline may be extended with a formal written (email) request from the Board chair to the OPP Safety Officer.

7.6. Actions Following the BOI

7.6.1. The OPP Safety Officer shall retain responsibility to review the BOI report to determine thoroughness, completeness, and suitability of findings and recommended corrective actions.

7.6.2. The OPP Safety Officer will ensure appropriate government and contractor follow-up in response to BOI recommendations.

- Request development of a corrective action plan (CAP) which defines corrective actions for resolving relevant BOI findings.
- Track CAP implementation and confirm progress remains on schedule.
- Verify CAP implementation.
- Request an effectiveness review once the responsible organization has validated completion of the CAP.
- Document closing of all proceedings.

Section 5: Personal Protective Equipment (PPE)

1. Purpose and Scope

This section prescribes requirements, procedures, and policies for providing personal protective equipment and the apparel necessary to protect the health and safety of all personnel from occupational hazards.

Personal protective equipment is the last choice for the control of workplace hazards. Engineering and administrative controls shall be initiated to reduce or eliminate the hazard before personal protective equipment is required.

When engineering and administrative controls do not eliminate or reduce the hazard, adequate protective equipment and apparel shall be provided to prevent or minimize injury or occupational disease. Any breakdown, failure or misuse of PPE immediately leads to the worker being exposed to the hazard. Whether caused by misuse or improper maintenance, PPE can become ineffective without the wearer realizing it, thereby, creating potentially serious consequences. For this reason, an accurate hazard assessment, proper equipment selection, storage, maintenance, employee training (i.e., including equipment limitations), and mandatory enforcement of equipment use are key elements of an effective PPE program.

2. References

- 29 CFR 1910, Subpart I
- ANSI (American National Standards Institute), Z87.1, (Eye and Face Protection).
- ANSI, Z41 1983, (Safety Toe Footwear).
- ANSI, Z88.2, (Respiratory Protection).
- ANSI, Z89.1, Z89.2 (Protective Headgear)

3. General Requirements

3.1. Responsibilities

3.1.1. It is an employer's responsibility to ensure that the proper PPE (e.g., hard hat, respirator, safety eyewear, protective footwear, gloves, harnesses, personal fall protection systems) is available to personnel. It is the supervisor's responsibility to ensure PPE is provided to *personnel* and worn when necessary. Supervisors or on-site managers will inform all visitors to a research station, project, field camp, or other OPP-supported site of the need to wear specific PPE in certain areas and ensure such equipment is available.

3.1.2. It is the responsibility of *personnel* to wear their personal protective equipment when required, report any damage that may have occurred to it during use, and store it as the manufacturer recommends.

3.2. Protective Eyewear Policy

All *personnel* working in eye-hazard areas are required to wear eye protection specific to the hazard encountered.

- Supervisors are responsible for ensuring that eye-hazard operations and hazard areas are identified, and that *personnel* are provided adequate PPE, to include corrective lenses if needed. (Note: NSF OPP will not pay for prescription safety glasses, since there are safety glasses and/or goggles that can be worn over prescription glasses.) Examples of eye-hazard operations are welding, grinding, abrasive blasting, using acids or corrosives, and chipping. Bright sunlight is also a hazard. Eye-hazard areas are those areas immediately surrounding operations in which light, chemicals, projectiles, particles, or dust would be reasonably expected to cause eye damage if an unplanned event occurs.
- Supervisors are also responsible for ensuring that all PPE and eye tests provided to *personnel* are essential for performing their work. For *personnel* who are only intermittently exposed to eye hazards, using goggles over their glasses may be a suitable alternative to the purchase of safety glasses.
- Eye hazards and protective equipment requirements shall be reviewed with *personnel* during orientation and periodically thereafter. All personnel shall be informed of eye hazards and required to wear safety glasses or equivalent while conducting eye-hazardous operations or while in eye-hazardous areas in OPP facilities or on OPP-funded projects or research.
- All industrial safety glasses shall meet the requirements of American National Standards Institute (ANSI) Z87.1.
- Contact lenses are not considered appropriate substitutes for eye protection.
- For chemical, eye-hazardous operations, emergency eyewashes shall be readily available.

3.3. Protective Footwear Policy

All *personnel* conducting foot-hazard operations or working in foot-hazard areas (extreme cold, snow, around heavy equipment, heavy material handling) are required to wear protective footwear.

- Supervisors are responsible for ensuring that foot-hazard areas are identified and that *personnel* are using the appropriate protective footwear for the hazards associated with the specific job. Foot-hazard operations are those operations that have a high potential for foot injuries, such as cold exposure, material handling, construction, or field operations.
- Foot hazards and protective equipment requirements shall be reviewed with *personnel* during orientation and periodically thereafter.
- Protective footwear when working in areas where there is a danger of foot injuries due to falling or rolling objects, or objects piercing the sole, or when the use of protective footwear will protect the affected employee from an electrical hazard, such as a static-discharge or electric-shock hazard, that remains after the employer takes other necessary protective measures shall meet the requirements of ANSI Z41.1 or ASTM F-2412-2005
- Waterproof boots will be considered protective footwear. If a compression hazard exists along with the hazard of excessive moisture, then the waterproof boots will be the type that have a safety toe built in.
- Protective footwear shall be properly maintained by the *participant* while it is in the employee's possession.

3.4. Respiratory Protection

- When respiratory protective equipment is required, a respiratory protection program shall be developed and implemented. The program shall include, but not be limited to, training, fit

testing, equipment selection, maintenance, and medical surveillance, in accordance with 29 CFR 1910.134.

- The medical status of individuals who are to wear respirators shall be evaluated, and a statement from a physician or licensed healthcare professional that indicates the individual is qualified to wear the specified type of respirator shall be kept by the prime contractor's safety office.
- Only approved respiratory protective devices shall be provided and used. "Approved" means that the respirator and its component parts have been tested and listed as satisfactory by the National Institute for Occupational Safety and Health (NIOSH), or applicable host nation requirements, where available.
- A competent person knowledgeable of inhalation hazards and respiratory protective equipment shall conduct a step by step evaluation to ensure only appropriate respiratory protection for the conditions of exposure (including high altitude) is utilized.

3.5. Protective Headwear

All *personnel* shall wear hard hats when working in or visiting a hard hat area or working at heights..

- Hard hat areas shall be identified, and all points of entry to a hard hat area shall have a hard hat caution sign posted.
- Hard hat areas shall be general areas, such as construction, alteration, or demolition sites rather than specific portions of a building or project.
- All protective headgear shall meet the requirements of ANSI Z89 Class C,E,and/or G.
- Protective headgear worn near electric lines and equipment shall be of the appropriate class.

For additional information see Section 17: Helmet Policy.

3.6. Hearing Protection

- All *personnel* that are exposed to excessive noise shall be considered for inclusion in a medical surveillance program for hearing conservation, in accordance with 29 CFR 1910.95.
- Noise monitoring shall be coordinated by the contractor's safety office.
- Results of the noise monitoring shall be used to determine the appropriate type of hearing protection.
- All *personnel* working in a noise-hazardous area shall wear hearing protection.
- Supervisors are responsible for identifying potential hazards, training *personnel* in the proper use of hearing protection, and enforcing the use of hearing protection. The need for hearing protection is suspected when any one of the following three conditions exist:
    - *Personnel* have difficulty communicating with each other by voice when in the presence of noise.
    - *Personnel* report head noises or ringing in the ears (tinnitus) after working for several hours in the noise.
    - *Personnel* sustain a temporary hearing loss following several hours of noise exposure, which has the effect of muffling speech and other sounds.

3.7. Miscellaneous PPE

A number of chemical, physical, and environmental hazards can be controlled with miscellaneous PPE.

- Clothing, such as coats, parkas, pants, or coveralls made of special materials designed to protect against specific or general exposures to irritant, toxic, or corrosive materials may be reusable or disposable. In most cases, protective clothing is made of special impervious materials, which can withstand repeated or prolonged contact with solvents, acids, alkalis, or other chemical or physical agents.
- Special foot protection, such as slip-on toe protectors, metatarsal protectors, hip boots, oil or chemical resistant boots, waterproof boots, or insulated boots.
- Personal flotation devices (PFDs).
- Insect bite kits, for protecting employees who are sensitive to or allergic to insect bites.
- Chaps, for protection when using chain saws.
- Safety harnesses and lanyards for fall protection.
- Insect repellent in areas infested with chiggers, mosquitoes, and ticks.
- What about arc flash clothing and face shields?

Section 6: Fall Protection and Prevention

1. Purpose and Scope

1.1. This section provides the minimum requirements for fall protection applicable to those exposed to falls, working at heights, and/or using fall protection equipment.

1.2. The policies and procedures of this section aim to protect program participants by reducing the risk of injury or fatality due to falls, either from height or from the same level.

1.3. The OPP SOH will provide technical guidance and assistance to help maintain compliance and issue waivers or variances as specified in this policy.

2. References

- 29 CFR 1910, Subpart D Walking-Working Surfaces
- 29 CFR 1926 Subpart M Fall Protection
- 29 CFR 1910.132 Personal Protective Equipment

3. General Requirements

3.1. When program participants are exposed to falls, contractors and program partners working under the jurisdiction of the National Science Foundation (NSF), Office of Polar Programs (OPP) are responsible for developing a written fall protection and prevention program ((FPPP) (See Paragraph 7)).

3.2. The fall protection threshold height requirement for work covered by this policy, unless specified separately, will be 4 ft (1.2 m) or more above adjacent floor or ground level.

3.3. Military members while conducting inherent military operations shall comply with service instructions, regulations, and operational orders.

3.4. Walking and working surfaces of a workplace must be kept clean, orderly and in sanitary condition and to the extent feasible, dry.

3.5. Any program participants exposed to fall hazards shall be protected from falling to a lower level using standard guardrails, work platforms, temporary floors, safety nets, engineered fall protection systems, personal fall arrest systems, or the equivalent, in the following situations:

3.6. Whenever workers or researchers are exposed to falls from unprotected sides or edges, access ways, unprotected roof edge or floor openings, holes and skylights, unstable surfaces, leading edge work, scaffolds, formwork, work platforms, re-bar assembly, steel erection, towers, and engineered metal buildings.

3.7. Whenever workers or researchers operate on access ways or work platforms over water or ice, or machinery.

3.8. When workers are installing or removing sheet piles, h-piles, cofferdams, or other interlocking materials from which they may fall six feet (1.8 meters) or more.

3.9. Wherever there is a possibility of a fall from any height onto dangerous equipment, hazardous operation, into a harmful environment, or onto an impalement hazard.

3.10. Whenever connectors are working at the same connecting point (for steel erection activities), they shall connect one end of the structural member before going out to connect the other end. The connectors shall always be tied off 100%.

4. Fall Hazards

4.1. Fall hazards must be evaluated to determine the preferable method of control. The order of control measures (the hierarchy of controls) to abate fall hazards or to select and use a fall protection method to protect workers performing work at heights shall be:

4.2. Elimination. Remove the hazard from work areas; change the task, process, or controls; or use other means to eliminate the need to work at heights, with its subsequent exposure to fall hazards (i.e., build roof trusses on ground level and then lift into place, or design a change by placing a meter or valve at a lower level). This control measure is the most effective.

4.3. Prevention. Isolate and separate fall hazards from work or research areas by erecting same-level barriers, such as guardrails, walls, covers, or parapets.

4.4. Work platforms. Use scaffolds, scissor lifts, work stands, or aerial lift equipment to facilitate access to work or research locations and to protect personnel from falling when performing work at elevated locations.

4.5. Administrative Controls. Introduce new work practices that reduce the risk of falling from heights or warn people to avoid approaching a fall hazard (i.e., warning systems, warning lines, audible alarms, signs, or training for workers and/or researchers to recognize specific fall hazards).

4.6. Personal Protective Systems and Equipment. Use fall protection systems, including (in order of preference) restraint, positioning, or personal fall arrest. All systems require the use of full body harness, a means of connecting, and a safe anchorage system.

5. Roles and Responsibilities

5.1. Fall Protection Program Manager (FPPM)

5.1.1. The Prime Contractor's FPPM is the designated authority responsible for the overall development, implementation, monitoring and evaluation of the Fall Protection Program. This person can also function as a Qualified Person (QP), Competent Person (CP), CP trainer, QP trainer and/or competent rescue trainer if so trained.

5.1.2. Certifies through documentation that the inspections required by this section have been accomplished (See Paragraph 10).

5.2. Qualified Person for Fall Protection

5.2.1. The QP is responsible for technical support of the Fall Protection Program.

5.2.2. The QP shall have advanced understanding and knowledge of the requirements, equipment and systems, physical sciences, and engineering principles that affect equipment and systems for fall protection and rescue.

5.2.3. The QP will supervise the design, selection, installation and inspection of certified anchorages, and horizontal lifelines.

5.3. Competent Person for Fall Protection

5.3.1. The CP is responsible for the immediate supervision, implementation, and monitoring of the Fall Protection Program.

5.3.2. The CP shall have the authority to stop the work immediately if it is determined to be unsafe and take prompt corrective measures to mitigate fall hazards.

5.4. End User

5.4.1. The End User shall understand workplace activities and follow the policy and procedures and the instructions of the CP regarding the use of fall protection and rescue systems and equipment.

5.4.2. Bring all unsafe or hazardous conditions or actions that may cause injury to them or others, to the attention of the CP.

5.4.3. Properly use, inspect, maintain, store and care for their fall protection equipment and Systems.

5.4.4. Inspect all fall protection equipment for damage or defects, prior to each use and notify the CP of recognized problems and shall not use that equipment.

5.5. Competent Rescuer: The Competent Rescuer is responsible for anticipating the potential for planned rescue and ensuring effective rescue plan/procedures and methods are in place before End Users starts any work at heights. This function may be performed by local emergency services, in-house professionals, competent or qualified persons or contractor services.

5.6. Authorized Rescuer: Authorized Rescuers are responsible for performing and/or assisting in workplace rescues for personnel suspended in or attached to fall protection systems.

6. Training

6.1. Training for all involved personnel, the Program Manager, Qualified Person(s), Competent Person(s), End Users, Authorized and Competent Rescuers, as well as any associated fall protection trainers, shall be in accordance with the requirements prescribed in ANSI/ASSE Z359.2.

6.2. Competent Person for Fall protection (CP) shall be trained by a CP trainer or a Qualified Person Trainer (see ANSI/ASSE Z359.2).

6.3. Documentation

6.3.1. A training record shall be maintained for each participant and retained for current program and previous program participants for a period of no less than one (1) year.

6.3.2. Individual certification of completion shall contain names of participants trained, the time, date, and location of training, and the name and contact information for the trainer.

6.3.2. Organizational documentation shall include trainer/evaluator's name, list of students, training or evaluation organization's name, dates and times of training and evaluations, course objectives, content of training program, and description of performance based physical demonstrations of skills or exercises.

7. Fall Protection and Prevention Plan

7.1 The OPP requires the development and implementation of a detailed fall protection and prevention plan (FPPP) and believes it essential to safeguard program participants at risk for a fall.

7.2. This plan may be developed by the FPPM, CP or QP.

7.2.1. If the plan includes fall protection components or systems requiring direction, supervision, design calculations or drawings by a QP, the name, qualifications, and responsibilities of the QP shall be addressed.

7.3. The plan shall describe, in detail, the specific practices, equipment and control methods used to protect workers from falling to lower levels.

7.4. This plan shall be updated as conditions change, at least every twelve months and shall include:

- Duties and responsibilities: Identify CPs and QPs and their responsibilities and qualifications.
- Descriptions of training requirements to include safe use of fall protection equipment.
- Anticipated fall hazards and prevention/control methods.
- Inspection, maintenance, and storage locations of fall protection equipment.
- Design of anchorages/fall arrest and horizontal lifeline systems.
- Rescue plan and procedures.
- Inspection and oversight methods.
- Means used to enforce compliance with the FPPP.
- Procedures for evaluating program effectiveness.

7.5. Rescue and Evacuation Plan and Procedures

7.5.1. Provide a Rescue and Evacuation Plan in accordance with ANSI Z359.2 and include in the FPPP.

7.5.2. Include a detailed discussion of the following: methods for assisted rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes and methods to a medical facility.

8. Equipment and Systems

8.1. Enforce the use of personal fall protection equipment and systems for each specific work activity and designate in a Site-Specific Fall Protection and Prevention Plan and JHA/AHA where program participants are exposed to a fall hazard (to include fall arrest, restraint, and positioning). Grantees shall comply with the contractor's site-specific plans or submit a valid plan for government acceptance when performing work activities at an OPP controlled site or station.

8.2. Personal fall protection systems and equipment are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition,
personal fall protection systems are required when operating other equipment such as scissor lifts. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, travel, or while performing work.

8.3. Provide personal fall protection equipment, systems, subsystems, and components that comply with 29 CFR 1926.500 Subpart M, ANSI Z359.0, ANSI Z359.1, ANSI Z359.2, ANSI Z359.3, ANSI Z359.4, ANSI Z359.6, ANSI Z359.7, ANSI Z359.11, ANSI Z359.12, ANSI Z359.13, ANSI Z359.14, ANSI Z359.15, ANSI Z359.16 and ANSI Z359.18.

8.3.1. Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. The use of body belts is not acceptable.

8.3.2. Equip all full body harnesses with Suspension Trauma Preventers such as stirrups, relief straps, or similar equipment to provide short-term relief from the effects of orthostatic intolerance.

8.3.3. Snap hooks and carabineers must be self-closing and self-locking, capable of being opened only by at least two consecutive deliberate actions and have a minimum gate strength of 3,600 lbs. (1633 kg) in all directions.

8.3.4. Only use webbing, straps, and ropes made of synthetic fiber.

8.5. The maximum free fall distance when using fall arrest equipment must not exceed 6 feet (1.8 m) nor contact a lower level.

8.6. A personal fall arrest system that was subjected to an impact must be removed from service immediately.

8.7. Anchorage

8.7.1. Anchorages used for attaching the Personal Fall Arrest System (PFAS) shall be independent of any anchorage used to support or suspend platforms. They shall be capable of supporting at least 5,000 lbs. (22.2 kN) per worker attached or designed by a QP for twice the maximum allowable arrest force on the body.

8.7.2. The anchorage strength requirement for restraint systems shall be 3,000 lbs. (13.3 kN) or designed by a QP for two times the foreseeable force.

8.7.3. Anchorage strength for Ladder-Climbing Devices (LCD) shall be a minimum of 3,000 lbs.

8.7.4. Do not use electric conduits, utility pipes, ductwork, or unstable points as anchorages.

8.8. Connectors used to tie the PFAS to any anchorage shall be capable of withstanding without breaking 5,000 lbs. (22.2 kN) load per worker attached.

8.9. Horizontal Lifelines (HLL)

8.9.1. Provide HLL in accordance with 29 CFR 1926.500.

8.9.2. Commercially manufactured HLL's must be designed, installed, certified, and used, under the supervision of a qualified person, for fall protection as part of a complete fall arrest system which maintains a safety factor of two (2).

8.9.3. The competent person for fall protection may (if deemed appropriate by the qualified person) supervise the assembly, disassembly, use and inspection of the HLL system under the direction of the qualified person.

8.9.4. Locally manufactured HLLs are not acceptable unless they are custom designed for limited or site-specific applications by a Registered Professional Engineer who is qualified in designing HLL systems.

8.9.5. Steel cable/wire rope guardrails may not be used as a Horizontal Lifeline (HLL) unless designed and approved by a QP.

8.10. Ladder-Climbing Devices

8.10.1. A LCD is a sleeve or cable/rope attached to a fixed ladder over 20 ft (6 m) in length.

8.10.2. The free fall distance when using a LCD shall not exceed 2 ft (0.6 m).

8.10.3. There shall be 100% transition at the top of the LCD for safe access to above work surface or roof.

9. Additional Measures

9.1. Covers

9.1.1. Install covers (or other methods of control) on any hole 2 in (5.1 cm) or more in its least dimension on walking/working surfaces such as floors, roofs or other openings.

9.1.2. Covers shall be capable of supporting without failure, at least twice the weight of the worker, equipment, and material combined.

9.1.3. Covers shall be secured when installed, clearly marked with the word “HOLE”, “COVER” or “Danger, Roof Opening-Do Not Remove” or color-coded or equivalent methods (e.g., red or orange “X”).

9.2. Guardrails. Design, install and use guardrails in accordance with 29 CFR 1926 Subpart M.

9.3. Nets. Design, install and use safety nets in accordance with 29 CFR 1926 Subpart M.

9.4. Warning Line Systems (WLS). WLS must be developed in accordance with 29 CFR 1926.502 and must be approved by the Contractor’s Safety and Health before program participants are exposed to fall hazards.

9.5. Safety Monitoring Systems (SMS). The use of SMS as a fall protection method is prohibited.

9.6. Other Engineered Fall Protection Systems

9.6.1. Fall protection is required on fixed ladders taller than (or that extend beyond 24 ft. As of November 19, 2018, cages are no longer considered compliant fall protection in newly installed fixed ladders. To meet the new standards, a personal PFAS or ladder safety system is required.

9.6.2. A personal fall arrest system or ladder safety system will be used to replace any damaged or nonfunctioning section, cage, or well previously installed on a fixed ladder.

9.6.3. As of November 19th, 2036, cages will no longer be accepted as a form of fall protection, and all fixed ladders taller than (or that extend beyond) 24 feet high must use a personal fall arrest system or a ladder safety system.
8.6.4. Existing fixed ladders that do not meet these requirements shall be brought to the attention of NSF OPP.

10. Inspection Requirements

10.1. The FPPM shall conduct an inspection of this program annually to certify that established procedures and requirements are being followed.

10.2. Periodic inspections shall be performed by an accepted Fall Protection Competent Person.

10.3. Inspections shall:

- Correct any deviations or inadequacies identified.
- Be documented, include the date of the inspection, contain any person(s) included in the inspection, and identify the qualified, competent, and/or authorized person(s) completing the inspections.
- Contain a review of the FPPP application and effectiveness.
- Include an evaluation of End User understanding of their roles and responsibilities.
- Include the deviations and inadequacies with recommended corrective action(s) and provide anticipated date(s) of completion and reinspection.

11. Reports

11.1. The contractor shall designate and submit qualifications and training certificates of qualified and/or competent person(s) designated as the authority with management responsibility for the FPPP and additionally submit qualifications of other designated competent and/or qualified persons with administrative responsibility to the NSF, OPP, Office of Safety and Occupational Health (SOH) when changes are made.

11.2. The contractor's designated authority (FPPM) shall complete an annual FPPP program review and certify through documentation that the inspections required by this section have been accomplished (See Paragraph 10).

Section 7: Hazardous Energy Control Program (Lockout and Tagout Procedures)

1. Purpose and Scope

1.1 The requirements of this section apply to the application of the Hazardous Energy Control Program (HECP) and Lockout/Tag-Out (LO/TO) procedures.

1.2 These policies and procedures are designed to protect participants from the accidental or unintended release of stored energy, movement, or flow in electrical potential, mechanical, or material systems, resulting in an injury or fatality.

1.3. Hazardous energy is any energy, including but not limited to mechanical (e.g., power transmission apparatus, counterbalances, springs, pressure, and gravity), pneumatic, hydraulic, electrical, chemical, nuclear, and thermal (e.g., high or low temperature) energies, that could cause injury to people(s).

1.4. The OPP SOH will provide technical guidance and assistance to help maintain compliance and issue waivers or variances as specified in this policy.

2. References

- 29 CFR 1910.147, The Control of Hazardous Energy (Lockout/Tagout)
- 29 CFR 1915.89, Control Energy (Lockout / Tags-Plus)
- NFPA 70E, Standard for Electrical Safety in the Workplace

3. General Requirements

3.1. Contractors and program partners working under the jurisdiction of the National Science Foundation (NSF), Office of Polar Programs (OPP) when working on or near any system that produces, uses, or stores hazardous energy are responsible for developing a written Hazardous Energy Control Program (HECP) (see Hazardous Energy Control Program below).

3.2. If an energy isolating device is capable of being locked out, the energy control program shall utilize lockout, unless it can be demonstrated that the use of a tag-out system will provide a level of safety equivalent to that obtained by using a lockout system.

3.3. As of January 2, 1990, whenever replacement, major repair, renovation, or modification of equipment is performed, and whenever new equipment is installed, energy isolating devices for such equipment shall be designed to accept a lockout device.

4. Roles and Responsibilities

4.1. Contractor SOH

4.1.1. Ensure that adequate HECP and LO/TO procedures are developed and implemented to verify the safety of employees and program partners and/or machinery or equipment.

4.1.2. Ensure that all Supervisors receive training on the HECP and LO/TO procedures.

4.1.3. Assist Supervisors/Foreman with developing equipment specific HECP and lockout procedures.

4.1.4. Regularly provide updates and changes and conduct annual reviews of HECP and LO/TO procedures.

4.1.5. Certify through documentation that the inspections required by this section have been accomplished (> See Paragraph 10 of this Section).

4.1.6. Ensure outside contractors have a HECP and LO/TO policy that complies with all applicable regulations and are at least as stringent as regulatory requirements.

4.2. Supervisors/Foremen

4.2.1. Assist with developing equipment specific LO/TO procedures.

4.2.2. Ensure that HECP and LO/TO procedures are properly applied in their area of operations.

4.2.3. Ensure that employees under their supervision apply HECP and LO/TO procedures where necessary.

4.2.4. Ensure that employees under their supervision have received training on how the HECP and LO/TO procedures function.

4.2.5. Ensure the availability of locks, tags, lockout box(s), and equipment specific lockout procedure(s) to all employees required to use them.

4.2.6. Determine who will be the Responsible/Lead (Primary) Authorized Individual for coordinating multiple sources/multiple crew lockouts.

4.2.7. Conduct a periodic inspection of the energy control procedure (at least annually) to ensure that the procedure and the provisions of this section are followed.

4.2.8. Identify and prioritize equipment list for LO/TO procedures.

4.3. Authorized Individuals: A person who locks out or tags out machines or equipment to perform servicing or maintenance on that machine or equipment.

4.3.1. Conduct, implement and coordinate hazardous energy isolation LO/TO procedures as required by the employers HECP.

4.3.2. Apply and remove their own locks and/or tags and no one else's. Reference the employer's HECP for the removal of LO/TO devices.

4.3.3. Indicate when LO/TO procedures are required before submitting work requests to Supervisor.

4.3.4. Notify affected employees and participants of the application and removal of LO/TO devices in the work area.

4.3.5. Attend LO/TO training.

4.4. Affected Individuals
An employee or program participant whose job requires him/her to operate or use a machine or equipment on which servicing, or maintenance is being performed under LO/TO procedures, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

4.4.1. Abide by the rules of the LO/TO procedures.

4.4.2. Follow instructions of authorized individuals.

4.4.3. Contact their supervisor if there are any questions concerning the LO/TO situation.

5. Training

5.1. All program participants will receive initial and periodic (annual) training to recognize hazardous energy sources, the types and magnitude of the energy present in the workplace, and the methods and means necessary for energy isolation and control.

5.2. Contractors and program partners shall ensure training applicable to the roles and responsibilities is provided to authorized individuals and confirm their understanding of the purpose and function of the HEC procedures and that they possess the knowledge and skills required for the safe application, use, and removal of HEC devices.

5.3. When tagout systems are used (only when lockout is not possible), authorized individuals shall be trained in the limitations of tags.

5.4. Authorized individuals shall be retrained in HEC procedures whenever:

- There is a change in job responsibilities or a change in systems or processes that present a new energy control hazard.
- A periodic inspection reveals, or there is reason to suspect the presence of, inadequacies in or deviations from the authorized individual's knowledge or use of HEC procedures.
- There is a change in a contractor or local HEC procedure(s).

5.5. Affected individuals whose work operations are or may be in an area where energy control procedures may be used shall be instructed about the procedure and about the prohibition against attempting to restart or re-energize machines or equipment that are locked out or tagged out. This training may be accomplished during regularly scheduled safety meetings. They shall be made aware that lockout or tag-out are performed only by the authorized individuals performing the servicing or maintenance.

5.6. Documentation

5.6.1. A training record shall be maintained for each participant and retained for current program and previous program participants for a period of no less than one (1) year.

5.6.2. Individual certification of completion shall contain names of participants trained, the time, date, and location of training, and the name and contact information for the trainer.

5.6.3. Organizational documentation shall include trainer/evaluator's name, list of students, training or evaluation organization's name, dates and times of training and evaluations, course objectives, content of training program, and description of performance based physical demonstrations of skills or exercises.

6. Hazardous Energy Control Program

6.1. The HECP shall clearly and specifically outline the scope, purpose, authorization, roles and responsibilities, rules, and techniques to be used for the control of hazardous energy and provide the requirements of this Section (See Paragraph 6.2) and those of 29 CFR 1910.147, ANSI Z244.1, and ANSI A10.44.

6.2. The HECP shall include, but are not limited to, the following:

6.2.1. HECP procedures, required equipment, specific steps to control each energy source and include isolating, blocking, verifying, and securing systems.

6.2.2. Means of coordinating and communicating HEC activities with all site personnel (include all contractor's, government, suppliers, visitors and any other affected individuals) to ensure continuity of protection.

6.2.3. Responsibilities and procedural steps for the placement, removal, and transfer of locks, tags and other control devices.

6.2.4. Responsibilities, procedural steps, and means of accounting for placing and removing protective grounds.

6.2.5. Coordination (Shift/Schedule and redeployment changes). Provisions shall be made to ensure total continuity of HEC protection during shift, personnel, and staff redeployment changes.

6.2.6. Procedural steps, responsibilities, and requirements for testing the system to verify the effectiveness of isolation and control.

6.2.7. Instruction for emergency procedures.

6.2.8. The means used to enforce compliance with the HECP.

6.2.9. Procedures for evaluating program effectiveness.

7. Equipment and Systems

7.1. No LO/TO device shall be removed by anyone other than the individual who placed it.

7.2. Locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware shall be provided for isolating, securing, or blocking equipment from energy sources.

7.3. LO/TO devices shall be singularly identified, shall be the only devices used for controlling energy, shall not be used for other purposes.

7.4. LO/TO devices shall be capable of withstanding the environment to which they are exposed for the maximum period that exposure is expected.

7.4.1. Tags shall be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible.

7.4.2. Tags shall not deteriorate when used in corrosive environments, such as areas where acid and alkali chemicals are handled and stored.

7.5. LO/TO devices shall be standardized within the facility according to at least one of the following criteria: color, shape, or size. Additionally, tag-out devices should be standardized in print and format.

7.6. LO/TO devices shall be substantial:

7.6.1. Lockout devices shall be substantial enough to prevent their removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.

7.6.2. Tags, including their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal.

7.7. LO/TO devices shall clearly identify the authorized individual (by name) applying the device, include the individuals trade, contact information and redeployment date.

7.8. LO/TO devices shall warn against the hazardous condition if the machine or equipment is energized.

8. Additional Measures

8.1. Removal of LO/TO devices by other than the Authorized Individual is considered a High Hazard Activity. LO/TO devices may be removed by the Authorized Individual's immediate trade Supervisor, if the Authorized Individual who applied the HEC device is not available.

8.2. The Supervisor must:

8.2.1. Verify that the Authorized Individual who applied the device is unavailable, every effort must be exhausted to contact this individual.

8.2.2. Verify the servicing and/or maintenance are complete, and the equipment is ready for normal operation. Check the area or equipment to ensure:

- Operating controls are set to the "off" position.
- Tools and nonessential items are removed, and equipment components (e.g. guards) are in place.
- Affected employees and others in the work area must be warned that power is about to be restored.
- Ensure all persons are safely positioned away from the equipment/system.
- Verify other Locks or tags are removed from the energy isolating device(s) by the employees who applied them.
- 8.1.3. Document that all reasonable efforts were made to contact the Authorized Individual to inform him/her that his/her device has been removed.

8.1.4. Document that the Supervisor has contacted the responsible Manager to notify and verify that the lock needs removal.

8.1.5. Before the Authorized Individual returns to work, ensure they are informed that their lock/tag has been removed.

9. Inspection Requirements

9.1. A qualified individual shall conduct an inspection of the energy control procedures at least annually to ensure that established procedures and requirements are being followed.

9.2. Periodic inspections shall be performed by a competent person other than the one(s) utilizing the energy control procedures being inspected.

9.3. Periodic inspections shall be performed by a competent and/or authorized persons to identify machinery or equipment requiring HEC provisions. This inspection shall identify and list the machine or equipment on which the energy control procedures are used.

9.4. Inspections shall:

9.4.1. Correct any deviations or inadequacies identified.

9.4.2. Be documented, include the date of the inspection, contain any person(s) included in the inspection, and identify the qualified, competent, and/or authorized person(s) completing the inspections.

9.4.3. Contain a review of the HECP and LO/TO procedures application and effectiveness.

9.4.4. Include an evaluation of authorized individuals, affected employees, and participants understanding of their roles and responsibilities.

9.4.5. Include the deviations and inadequacies with recommended corrective action(s) and provide anticipated date(s) of completion and reinspection.

10. Reports

10.1. The contractor shall designate and submit qualifications and training certificates of qualified and/or competent person(s) designated as the authority with management responsibility for the HECP and additionally submit qualifications of other designated competent and/or qualified persons with administrative responsibility to the NSF, OPP, Office of Occupational Safety and Health (SOH) when changes are made.

10.2. The contractor's designated authority shall complete an annual HECP and LO/TO program review and certify through documentation that the inspections required by this section have been accomplished (> See Paragraph 9, Inspection Requirements of this Section (above)).

Section 8: Confined Space Entry Program

1. Purpose and Scope

This section contains requirements for practices and procedures to protect personnel from the hazards associated with entry into permitted confined spaces.

This section applies to all operations and research activities performed under OPP auspices.

2. References

- 29 CFR 1910.146
- DHHS (NIOSH) Publication No. 87-113; "A Guide to Safety in Confined Spaces" http://www.cdc.gov/niosh/docs/87-113/default.html

3. General Requirements

This section explains the minimum requirements for an acceptable, written, site-specific confined space program. In situations where competing requirements exists, the most restrictive requirement prevails. General requirements include:

- At each activity, a competent person shall evaluate whether there is potential for permit-required confined space entry.
- The evaluation shall use the definitions presented in paragraph 4 of this section to determine the presence of confined spaces.
- A list of confined spaces (both permit-required and non-permit-required) shall be maintained on site.
- All permit-required confined spaces shall be identified with a sign or by any other equally effective means to inform personnel of the existence, location of, and danger posed by the permit-required confined space. Signage will be written in English and the host nation language and will read as follows:
    - **DANGER -- PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER**

3.1. Responsibilities

3.1.1. Authorized Entrants

Authorized entrants shall:

1. Communicate with the attendant as necessary so the attendant can monitor entrant status and alert entrants of any need to re-evaluate the permit-required confined space.
2. Evacuate the permit-required confined space and alert the attendant whenever they:
    a. Recognize any warning signs or symptoms of exposure to a dangerous situation,
    b. Or if they detect a prohibited condition, or whenever the attendant or entry supervisor orders evacuation, or whenever an evacuation alarm is activated.

3.1.2. Attendants

Attendants shall:

1. Remain outside the permit-required confined space during entry operations until relieved by another attendant.

2. Take action when conditions warrant evacuation of the permit-required confined space, inform the entry supervisor of conditions, and warn persons approaching the permit-required confined space.
3. Maintain an accurate list of personnel within the permit-required confined space and a means to identify the personnel.
4. Communicate with entrants as necessary to monitor them and alert them of the need to evacuate.
5. Immediately order evacuation of the permit-required confined space if additional hazardous conditions emerge.
6. Perform non-entry rescue as specified in the permit and summon rescue or other emergency services as necessary.
7. Not perform any other duty other than that of attendant during permit-required confined space entry.

3.1.3. Entry supervisors

Entry supervisors shall:

1. Verify that all tests specified by the permit have been conducted and that all necessary equipment and procedures are in place before entry.
2. Terminate the entry when assigned work is completed or when conditions warrant evacuation.
3. Verify that rescue services are available and that means of summoning them are operable.
4. Ensure that entry operations are consistent with the terms of the entry permit and that acceptable conditions are maintained.

3.2. Permit-Required Confined Space Entry Procedures

- The designated official shall develop and implement a system for preparing, issuing, and canceling permit-required confined space entry permits. At a minimum, these permits must have the information listed in the sample permit (Appendix C) in whatever format is desired. Additional information may be included if necessary or desired.
    - Before entry begins, the entry supervisor identified on the permit shall sign the permit to authorize entry.
    - The completed permit shall be posted at the entry portal so that entrants can confirm the pre-entry preparations have been completed.
    - The permits shall be kept in a log book on-site for review by OPP.
    - The duration of the permit shall not exceed the time required to complete the task identified on the permit.
- Plans and procedures shall be developed for summoning rescue personnel and for preventing unauthorized personnel from attempting a rescue.
- The entry supervisor shall designate at least one attendant who will remain outside the permit-required confined space for the duration of the activity.
- The designated official shall develop procedures to ensure that when more than one crew is authorized entry, the activities of one crew will not interfere with the work of the other crew.
- The designated official shall review the entry program periodically to ensure the measures contained in the program are still adequate.

3.3. Training Requirements

- All employees shall be instructed not to enter permit-required confined spaces without the proper permit that describes procedures and practices for the space.
- Employees who are required to enter permit-required confined spaces or act as attendant or entry supervisor shall be trained in the knowledge and skills necessary for the safe performance of their work. The employees must also be familiar with the hazards associated with the entry and the measures used to ensure safe conditions.
- Training shall conform to the requirements of the references above.
- All training shall be certified by the instructor upon successful completion by participants.
- Evidence of training shall be available onsite where the entry is occurring for government review if needed.

3.4. On-Site Rescue Teams

- Each member of the rescue team shall be trained in the use of personal protective equipment and other equipment necessary to perform a rescue.
- Each member of the rescue team shall practice making a rescue at least once every 12 months. The practice drill shall simulate actual conditions within the permit-required confined space.
- Each member of the rescue team shall receive the same level of training as authorized entrants and shall be trained in basic first aid and cardiopulmonary resuscitation (CPR).

3.5. Off-Site Rescue and Emergency Services

- To ensure availability in case of need, contact must be made with emergency services before entry into a permit-required confined space. If there are no emergency services, a rescue team must be established and trained in permit-required confined space rescue procedures, with all necessary emergency equipment.
- The rescue service shall be informed of the associated hazards that may be present during a rescue.
- A rescue team shall be provided access to all permit-required confined spaces for which rescue may be necessary so the service can develop appropriate plans. The team shall be trained in permit-required confined space rescue procedures, with all necessary emergency equipment at the work site.

3.6. Retrieval Systems

- Each authorized entrant shall use a chest or full body harness, with a retrieval line attached at the center of the entrant's back near the shoulder level or above the entrant's head.
- Retrieval lines shall be attached to a mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as the rescuer becomes aware of the need for rescue.
- A mechanical device shall be available to retrieve personnel from vertical permit-required confined spaces more than 1.5 meters (5 feet) deep.

3.7. Recordkeeping

Records shall be maintained at each facility by the supervisor documenting the training. Records shall include safety drills, inspections, tests and maintenance, and any atmospheric tests made, to include time, date, atmospheric concentrations of substances for which there is a permissible exposure limit, PPE used, and employees' names.

3.8 Sample Activity Hazard Analysis, Confined Space Entry

Listed below are hazards associated with entering a confined space and possible means of controlling those hazards.

Hazard: Toxicity

Causes:

- *Toxic levels of substances in confined space*
- *Decomposition of organic material in confined space*
- *Toxic mixture of substances in confined space*
- *Substances being used in confined space, e.g., cleaning solvents*
- *Residual vapors from previous contents of confined space*
- *Welding fumes or vapors*

Controls:

- *Evaluate previous history of the confined space to avoid reactions with residual chemicals, wall scale, and/or sludge, which can be highly reactive.*
- *Check for compatibility of materials when structural members and/or equipment are introduced e.g., aluminum ladder, cleaning solvents.*
- *Utilize proper respiratory equipment based on air monitoring.*

Hazard: Insufficient Oxygen

Causes:

- *Rust*
- *Use of other gases, e.g., nitrogen, carbon dioxide.*
- *Welding*

Controls:

- *Maintain atmospheric oxygen level of 21% by volume through ventilation and/or exhaust.*
- *Provide and maintain adequate ventilation and exhaust, as per specific conditions in the confined space.*
- *Self-contained breathing apparatus.*

Hazard: Explosion/Fire in Confined Space

Causes:

- *Combination of combustible gases and a spark from activity of an employee in confined space (dip testing tank, welding, electric tools, light bulbs, matches).*

Controls:

- *No matches, lighters, or other flame-producing sources allowed in confined space.*
- *Explosion proof bulbs.*
- *Provide adequate ventilation to prevent an enriched oxygen atmosphere or to eliminate the explosive or flammable atmosphere.*

Hazard: Explosion/Fire at Point of Entry.

Causes:

- *Employee welding, using power tool, or engaging in other spark-generating activity at point of entry.*

- *Driving automobile near confined space containing combustible materials.*

Controls:

- *Use non-sparking tools.*
- *Barricade entry point at a reasonable distance.*
- *Prohibit vehicles within immediate area.*

Hazard: Electrocution/Electric Shock

Cause:

- *Conductive walls of confined space picking up an electrically "hot" source in confined space.*

Control:

- *Ensure all electrical apparatus used comply with National Electrical Code (NEC) standards.*
- *Lock out electric sources.*

Hazard: Caught In/Crushing

Cause:

- *Entering a machine or area that has not been locked out, then having it activated.*

Control:

- *Manually isolating each piece of equipment before workers enter or while they work in a confined space (Locking out).*
- *Follow specific procedures for mechanical lockout.*

Hazard: Struck by Falling Objects in Confined Space

Cause:

- *Falling objects from walls of confined space.*
- *Objects falling through point of entry.*

Control:

- *Barricade entry of confined space.*
- *Wear appropriate personal protective equipment, i.e., hard-hat.*
- *Assess hazards before entry.*

Hazard: Falls While in Confined Space

Causes:

- *Wet, oily floors*
- *Configuration of internal surfaces.*
- *Holes/breaking through part of confined space.*
- *Falls over object or /tools.*
- *Poor lighting.*
- *Uneven surfaces.*

Controls:

- *Ensure floor or base is clean and dry.*
- *Wear proper foot protection.*
- *Locate, identify, and barricade existing holes*
- *Provide adequate illumination.*
- *Practice good work habits (housekeeping).*

- *Use guardrails and scaffolding properly.*

Hazard: Bodily Reactions, Strains, Abrasions

Causes:

- *Entering or leaving a cramped, sharp edged, high-level, or hazardous point of entry to a confined space.*
- *Maneuvering within a confined space.*
- *Low head room/striking head.*

Controls:

- *Wear personal protective equipment.*
- *Training to ensure awareness.*
- *Reduce "bulkiness" of clothing and equipment.*
- *Engineering controls to eliminate condition.*

Hazard: Eye Injuries

Causes:

- *Falling dust*
- *Grinding, chipping, other operations that cause flying debris.*

Control:

- *Wear proper eye protection at all times.*

Hazard: Contact with Temperature Extremes

Causes:

- *Steam discharge*
- *Welding surfaces*
- *Weather conditions*
- *Compressed gases, e.g., nitrogen.*

Controls:

- *Wear appropriate clothing and PPE.*
- *Limit time of exposure.*
- *Know symptoms of excessive exposure.*
- *Frequent breaks to ensure high fluid intake to compensate for hot climates and for hot conditions inside PPE.*

4. Definitions

Acceptable entry conditions: The conditions that must exist in a permit space to allow safe entry by personnel.

Attendant: The individual stationed outside a permit space who monitors the authorized entrants and performs assigned duties.

Authorized entrant: Person who is authorized to enter a permit space.

Confined space: A space that:

- is large enough and so configured that an employee can bodily enter and perform work;
- has limited or restricted means of entry and exit; and
- is not designed for continuous employee occupancy.

Entry: The action by which an employee passes through an opening into a permit-required confined space. Entry is assumed to be as soon as the employee's body breaks the plane of the opening.

Entry permit: The written document that is provided to allow and control entry into a permit-required confined space.
Entry supervisor: The person responsible for determining acceptable conditions prior to entry into a permit-required confined space and for terminating entry.
Designated official: The person responsible for evaluating permit-required confined spaces and ensuring program elements are enforced.
Hazardous atmosphere: An atmosphere that may expose employees to risk of death or injury from one or more of the following causes:

- Flammable gases or vapors in excess of 10 percent of the lower flammable limit (LFL).
- Airborne combustible dust in concentration equal to or greater than its LFL.
- Atmospheric oxygen less than 19.5% or greater than 23.5%.
- Atmospheric concentration of any substance that has a permissible exposure limit (PEL).
- Any other atmospheric condition that is immediately dangerous to life and health.

Non-permit confined space: A confined space that does not contain or, with respect to atmospheric hazards, does not have the potential to contain any hazard capable of causing death or serious physical harm.
Permit-required confined space: A confined space that has one or more of the following characteristics:

- It contains or has the potential to contain a hazardous atmosphere.
- It contains a material that has the potential to engulf an entrant.
- It has an internal configuration by which an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a small cross-section.
- It contains any other recognized serious safety or health hazard.

Permit system: The written procedures for preparing and issuing permits for entry and for returning the permit space to service upon termination of entry.
Rescue service: The personnel designated to perform rescue functions in permit-required spaces.
Retrieval system: The equipment used for non-entry rescue of a person from permit-required spaces.
Testing: The process by which hazards are identified and evaluated for entry into permit-required spaces.

Section 9: Respiratory Protection Program

1. Purpose and Scope

The purpose of this section is to prescribe requirements and procedures for selecting, using, and maintaining respirators.

This section applies to all employees who may wear a respirator. Contractors are required to submit a standard operating procedure (SOP) on the proper selection, use, maintenance, and disposal of respirators.

2. References

- 29 CFR 1910.134, OSHA Standard for Respiratory Protection
- ANSI Z88.2, Practice for Respiratory Protection

3. General Requirements

It has long been recognized that the respiratory tract is the most important route by which toxic substances enter the body. Most industrial poisonings are caused by inhaling toxic substances. The primary effort to control such hazards should be in the form of engineering controls, such as specially designed ventilation systems. If engineering controls cannot be implemented, or are cost prohibitive, infeasible, or inadequate, respirators must be used to protect the individual whenever hazardous conditions exist. A respiratory protection program shall be established and implemented in accordance with 29 CFR 1910.134. This program shall encompass, but not limited to, training, maintenance, and awareness of the limitations associated with various types of respirators.

3.1. Responsibilities

3.1.1. All Personnel

All personnel who might wear a respirator shall become familiar with the respiratory protection program, as outlined in this section. A copy of the program shall be maintained in the local safety office.

3.1.2. Supervisors

All supervisors shall:

- Request assistance from the contractor's safety office in conducting atmospheric testing of the work area to determine if employees are exposed to contaminant levels in excess of the threshold limit values (TLV) and/or permissible exposure limits (PEL).
- Request assistance from the contractor's safety office for respirator fit-testing.
- Enforce the use of respirators by employees. Written documentation of an employee's failure to wear respirators shall be cause for disciplinary action and shall be forwarded to the safety office for inclusion in the employee's medical records.
- Ensure all employees are trained in the proper use of respirators and report to their medical surveillance examinations.

3.1.3. Employees

All employees shall:

- Wear and maintain respirators as required.
- Notify supervisors of any problems with respirators, or if they are having respiratory problems.
- Report for training and medical surveillance examinations.

3.1.4. Contractor's Safety Office

The contractor's safety office shall:

- Ensure all respirators are approved by the National Institute for Occupational Safety and Health (NIOSH) or meet host nation requirements for local national employees.
- Provide oversight to ensure compliance with the respiratory protection program.

3.2. Program Requirements

- Respirators and cartridges/filters shall be selected according to the hazards to which the worker is exposed. Accordingly, project personnel must know which type of respirator or cartridge/filter to use in each particular situation.
- Supervisors shall be instructed in the proper use of respirators and their limitations (e.g., respirators designed for protection against one hazard may be ineffective against another).
- Employees shall ensure respirators are regularly cleaned, disinfected, and stored in a convenient, clean, and sanitary location.
- Employees shall be trained in the care of their respirator. Training shall include inspection for defects, cleaning and disinfection, repair, and storage.
- Supervisors shall not assign personnel to tasks requiring the use of respirators unless it has been determined that they are medically able to wear respirators while performing their work (see "Medical Requirements" below).

3.3. Training Requirements and Respirator Use

- Supervisors as well as employees must know which respirators and cartridges/filters are to be used in each situation. There must be written procedures in place that describe this. When new operations or projects develop, supervisors should contact the local safety office for assistance, as necessary.
- An additional person must be present in areas where the failure of a respirator could result in the wearer being overcome by a toxic or an oxygen-deficient atmosphere. Effective communications (visual, voice, or signal line) will be maintained between both (or all) individuals present.
- Supervisors shall ensure that their employees have an opportunity to handle the respirator, have it fitted properly, test its seal, and familiarize themselves with the respirator by wearing it at periodic training sessions.
- It must be stressed that respirators shall not be worn when a good fit cannot be achieved. A good fit cannot be achieved by anyone who has a beard, long sideburns, a long mustache, or stubble. Also, the absence of dentures can affect the fit of a face piece.
- If air-line respirators are used, the supplied air source shall be inexhaustible and the hose length cannot exceed 300 feet from the source to the user.

3.4. Maintenance, Care, and Storage

- Each respirator shall be inspected by the employee for defects before and after each use, and at least monthly, to assure it is in good working order. The inspections shall include a check of

the tightness of the connections and a check of the face piece, valves, connecting tube, and cartridge. All rubber and elastic parts must be inspected for pliability and signs of deterioration.

- Each self-contained breathing apparatus shall be inspected by the employee monthly. Air cylinders shall be fully charged, according to the manufacturer's instructions.
- If respirators are used regularly, they may be assigned to individual workers for their exclusive use.
- Respirators shall be regularly cleaned and disinfected. Those issued for the exclusive use of one worker shall be cleaned after each day's use. Those used by more than one person shall be thoroughly cleaned and disinfected after each use. To clean and disinfect respirators, they should be washed with detergent in warm water using a soft brush, rinsed thoroughly in clean water, rinsed in a disinfectant solution, rinsed again in clean water (to prevent skin irritation), and air dried in a clean place. Cleaner and sanitizer solutions that clean effectively and contain bactericide are also available.
- After inspection, cleaning, and necessary repair, respirators shall be stored in sanitary locations to protect against dust, sunlight, heat, extreme cold, excessive moisture, and damaging chemicals. It is useful to store non-emergency respirators in plastic bags after they have been cleaned and disinfected.
- Defective respirators shall be tagged and removed from service by the supervisor.
- Respirators shall not be stored in tool boxes and lockers unless they are in carrying cases or other protective containers.
- When stored, the face piece and exhalation valve must be in an upright or resting position. If stored in a bent, folded, or abnormal position, the face piece and exhalation valve can warp or become deformed and thereby void the NIOSH approval.

3.5. Identification of Respirators and Cartridges

Most manufacturers use the following guidelines when designing their product. Therefore, while the identification information given below is necessary to know, it is usually not of major significance to the purchaser. Assistance in ordering specific respirator equipment may be obtained from the local safety office.

- The primary means of identifying respirator cartridges should be via properly worded labels. Each cartridge shall have bold letters stating "Cartridge for (name of contaminant)." It shall also state "For respiratory protection in atmospheres containing not more than [X] percent by volume of (name of contaminant)."
- Each cartridge shall have a label warning that gas masks should be used only in atmospheres with enough oxygen to support life (at least 16 percent by volume), since the cartridges are only intended to neutralize or remove contaminants from the air.
- Each cartridge shall be painted a distinctive color for a particular contaminant. For example, an organic vapor cartridge is signified by the color black. A cartridge for use in ammonia gas atmospheres (limited to 300 ppm) is green.
- The use of one manufacturer's cartridge with another manufacturer's respirator is unacceptable. The problem with interchanging brand names is that an airtight seal cannot be guaranteed. In addition, the interchanging of respirator components voids any approval granted by NIOSH.

3.6. Medical Requirements

It is important that no employee be assigned to tasks requiring the use of respirators if, based upon their most recent medical examination, the examining licensed healthcare provider determines the employee will be unable to function normally while wearing a respirator, or if the safety and health of the employee or other employees will be impaired by his or her use of a respirator. The focus of the medical examination should be on pulmonary and cardiovascular fitness.

Workers who have indications of coronary artery disease, myocardial infarction, angina pectoris, or progressive or severe hypertension should only wear a continuous-flow, air-line respirator, unless approval from their physicians is obtained.

Those whose duty it is to respond to emergencies should not wear any type of respirator if they have a cardiovascular deficiency. Other physical conditions, such as diabetes or grand mal epilepsy, may limit respirator use. The final decision regarding respirator use for any individual is the responsibility of the examining physician.

4. Guide for Selecting Respirators

The contractor's safety office is responsible for advising supervisors on the type of respirator required. In selecting a respirator, safety and supervisory personnel should assemble the information needed by answering the following questions:

- What is the measured or estimated contaminant concentration at the breathing zone of the worker?
- What is the PEL and/or TLV of the contaminant? (Use the more stringent of the two.)
- Is the workspace oxygen deficient (less than 19.5% oxygen)?
- What is the lower explosive limit (LEL) of the contaminant?
- Does an IDLH situation exist at contaminant concentration?
- If the contaminant is a gas or vapor, is efficient sorbent available and is there adequate warning containing the contaminants dangers?
- Will eye irritation occur at contaminant concentration?
- Will skin absorption pose a problem?
- Are there other circumstances or conditions that should be considered?

Section 10: Hearing Conservation Program

1. Purpose and Scope

The purpose of this section is to eliminate occupational, noise-related hearing loss among personnel. Noise is unwanted sound that may injure the hearing mechanism in the ear. Noise-induced hearing loss may be temporary or permanent depending on the frequency and intensity of the noise and the duration of exposure.

This section applies to all personnel who may be exposed to noise greater than OSHA's PELs. The provisions of this appendix do not apply to deaf personnel, as defined in ANSI S3.20.

2. References

- 29 CFR 1910.95, OSHA, Occupational Noise Exposure
- 29 CFR 1926.52, OSHA, Occupational Noise Exposure

3. General Requirements

Employers are responsible for becoming familiar and implementing the requirements established in this section. They are responsible for identifying those areas where employees are exposed to high noise levels, posting notices in noise hazardous areas, using engineering controls, and educating employees on preventing hearing loss and the use of personal protective equipment (PPE). Noise hazards will be included in the position hazard analysis.

Employers shall notify the contractor's safety office of suspected noise hazardous areas. The local safety office shall then coordinate noise surveys to determine the level of exposure. In areas where employees are subjected to continuous noise levels of 85 dBA or impulse levels of 140 dBA, regardless of duration, engineering and administrative controls (such as limiting the duration of exposure) will be implemented to reduce the noise hazard. In noise hazardous areas where engineering and administrative controls are not feasible, any employee exposed to 85 dBA or greater shall be provided hearing protection devices and will be entered in the medical surveillance program. Nobody should be exposed to impulse or impact noise above 140 dBA peak sound pressure level.

3.1. Responsibilities

3.1.1. Employers

Employers shall:

- Request that the contractor's safety office measure and analyze all areas and equipment suspected of being noise hazardous. An area where one has to shout to communicate is probably over 85 dBA.
- Ensure engineering controls are established to protect employees from noise hazards.
- Ensure that only hearing-protective devices that meet requirements established by ANSI S3.19, are issued to employees exposed to noise-hazard areas.
- Ensure that the applicable job description contains the requirement that the employee must wear hearing protection in the performance of the job.
- Ensure that employees exposed to a noise-hazard work environment are considered for inclusion in the hearing conservation program.

3.1.2. Supervisors

Supervisors shall:

- Post signs or sticker labels on equipment or areas where noise is a hazard.
- Enforce the use of hearing-protective equipment.
- Include noise exposure in employees' activity hazard analyses (AHAs).
- Requisition hearing protection equipment that reduces ambient noise level to no more than 85 dBA at the wearer's ear.
- Use disciplinary actions when necessary to enforce the proper use of hearing protection.
- Ensure that employees receive orientation and ongoing training on hearing conservation during safety meetings.

3.1.3. Employees

Employees shall:

- Wear the provided and proper hearing protection, when required.
- Report for audiometric testing when required.
- Attend and participate in periodic safety and occupational health training.

3.2. Contractor's Safety and Occupational Health Office

The contractor's safety and occupational health office shall:

- Ensure that only calibrated equipment is used for measuring and analyzing noise.
- Notify supervisors of areas or equipment that produce hazardous noise.
- Maintain all noise survey records for 40 years.
- Make provisions to schedule personnel for audiometric testing and yearly follow-up hearing tests for all personnel included in the hearing conservation program (i.e., those who will potentially be exposed to 85 dBA for more than eight hours per day).

3.3. Occupational Health Nurses/Medical Testing Facility

Occupational health nurses and/or the medical testing facility shall:

- Ensure audiometric testing is conducted by a physician, audiologist, otolaryngologist, or a certified technician under the supervision of one of the listed professionals.
- Ensure that the audiometric testing is conducted in an environment that allows 0 dBA hearing levels at test frequencies of 500, 1000, 2000, 3000, 4000, and 6000 Hz. Testing shall also include pure tone, air-conductive hearing threshold levels in each ear, with test frequencies of at least 500, 1000, 2000, 3000, 4000, and 6000 Hz.
- Notify employees of any validated standard threshold shift (STS) in hearing loss.
- Maintain a roster of all personnel included in the hearing conservation program.

Section 11: Hazard Communication (HAZCOM) Program

1. Purpose and Scope

The purpose of this section is to establish a formal hazard communication program to inform and educate personnel on the occupational health hazards associated with the chemicals in their workplace.

This section is applicable to all personnel who are performing work or research within OPP funded and/or supported locations.

The hazard communication program has been developed, in accordance with 29 CFR 1910.1200, to ensure that all chemical substances that are brought into the workplace have been evaluated for their physical and health hazards. Information concerning these hazards must be transmitted to those employees with potential exposure. Examples of such exposure would be employees subjected to the hazardous chemical in the course of employment, through any route of entry (inhalation, ingestion, impaction, skin contact, or absorption), under normal conditions of use or in an emergency. Note that only those chemicals that have been classified as health or physical hazards, in accordance with 29 CFR 1910.1200, are required to be included in the hazard communication program. Employees should consult with the contractor's safety office if there is an uncertainty as to a chemical's inclusion.

2. References

- 29 CFR 1910.1200
- 29 CFR 1926.59
- UN Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

3. General Requirements

3.1. Major Elements

There are five major elements of the hazard communication program; 1) written hazard communication program; 2) chemical assessment and inventory; 3) hazardous chemical labeling system; 4) safety data sheets (SDSs); and 5) employee training. This appendix of the OPP SOH policy constitutes the written hazard communications program. The remaining elements are discussed below.

3.1.1. Chemical Hazard Assessment and Inventory

Every chemical funded by OPP (directly or indirectly) will be assessed for its chemical or physical hazards. Where applicable, substitute chemicals that are less hazardous shall be purchased for the assigned tasks. Chemical manufacturers or importers are required, by federal and international laws, to determine if the chemicals they sell or import are hazardous, and to provide this information via label, SDS, mark, or tag to the purchaser. Based on this information, the chemicals purchased shall be included in the hazardous chemicals and materials inventory, and the inventory will be continually updated.

As hazardous chemicals are purchased, they will be added to the inventory. As hazardous chemicals are disposed of, they will be removed from the list. However, data on their hazards will be maintained by the relevant supervisor and the contractor's safety office. Industrial hygiene and workplace inspections will include a check to ensure the accuracy of the inventory.

3.1.2. Hazardous Chemical Labeling System

Chemical manufacturers, importers, and distributors are required by federal and international laws to label, mark, or tag each container of hazardous chemicals leaving their workplace with:

- The identity of the hazardous chemical(s) contained within;
- An appropriate hazard warning label; and
- The name, address, and telephone number of the chemical manufacturer or importer or other source that can provide additional information on the hazardous chemical(s) and appropriate emergency procedures.

Supervisors shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged, or marked accordingly and that the label or other form of warning is legible, in English and in the host nation language, and is prominently displayed on the container. Supervisors shall also ensure the information is readily available during each work shift.

For the purpose of this requirement, container means any bag, barrel, bottle, box, can, cylinder, drum, storage tank, or similar enclosure that contains a hazardous chemical. Pipes and piping systems are not considered to be containers. However, pipe and piping systems will be labeled as specified above if substances that are transported within them are or will be contained in the hazardous material inventory and must meet GHS requirements. ANSI/ASME A13.1 provides the most common pipe identification standard in the United States and may be used for proper labeling references.

Portable containers into which hazardous chemicals are transferred shall be marked to indicate the chemical, hazardous or non-hazardous, which they contain. Containers that both contain and process chemicals may have signs, placards, process sheets, batch tickets, operating procedures, or other such forms of identity to ensure employees are aware of the hazards involved with the chemical or process.

3.1.3. Safety Data Sheets (SDS)

Federal law 29 CFR 1910, requires chemical manufacturers and importers to obtain or develop a Safety Data Sheet for each hazardous chemical they produce or import and employers to maintain a SDS for each hazardous chemical they procure and use. The inclusion of Federal Acquisition Regulation (FAR) clause 52.223-3 in purchase orders for chemical products will ensure that the manufacturer or distributor provides SDSs for those products. The contractor's procurement office will ensure that every purchase order will include FAR clause 52.223-3.

SDSs may take various forms (including operating procedures), and they may be designed to cover groups of hazardous chemicals if it is appropriate to address the hazard of the process rather than the individual chemicals. In these circumstances, the information contained in the SDS must be provided for each chemical in the process and be readily accessible during each work shift to all affected personnel.

When work center personnel receive an SDS, they shall forward a copy to the contractor's safety office and ensure the SDS is readily accessible to personnel in the work area, in a language understood by each worker. The new chemical will be included in the hazardous material inventory and added to the work area inventory. Information on the SDS will be used by the safety office to develop adequate hazard control and abatement procedures and establish training requirements for personnel exposed to the chemical.

3.1.4. Employee Information and Training

Supervisors are responsible for providing their personnel with an orientation on the purpose and requirements of this program, and specific training on hazardous chemicals in their workplace. This training will be conducted during the first four weeks of a new employee's assignment, when a new chemical is introduced in the workplace, or whenever the need exists. Specific training shall include, as a minimum:

- A description of those operations in the employee's work area where hazardous chemicals are present and in use;
- A chemical hazard evaluation. This will include a listing of those chemicals included in the hazardous material inventory for the work area, the work area labeling system, and the use of safety data sheets. Training in the use of the safety data sheets shall include the physical and chemical hazards of the chemical and the specific measures required to protect the employee from these hazards; and
- Methods and observations that may be used to detect the presence or release of a hazardous chemical within the work area.
- The supervisor will contact the contractor's safety office within the first four weeks of the new employee's assignment to schedule formal training for the employee in hazard communication.

3.2. Non-Routine Tasks

Before undertaking a non-routine task, supervisors shall inform employees of any hazards associated with the non-routine work they have been assigned. Generally, these hazards will have been pre-determined and brought to the supervisor's attention.

If the hazards have not been pre-determined, the supervisor will notify the safety office and request a hazard evaluation. The employee will then be informed of the associated hazards.

3.3. Hazard Communication for All Activities

All design plans and specifications for structures or activities will list any hazardous substances and materials incorporated in the design, including those used in the construction of the structure or performance of the activity. This list will serve as the primary notice to contractors of the hazardous materials and substances to which their employees may be exposed to while performing their work. It is also required that the contractor provide documentation of employee training in hazardous substances and chemicals used on every job site. It is required that the contractor develop an activity hazard analysis acceptable to the COR that identifies those hazards, including chemical hazards, anticipated during a particular phase of work, and proposes methods to control those hazards. Contractors shall utilize those sections of the activity hazard analysis and applicable SDSs to provide training to their employees.

Section 12: Chemical Hygiene Plan

This section is held for future development.

Section 13: Fire Prevention and Protection

1. Purpose and Scope

1.1. This section provides the minimum elements for maintaining and administering a fire prevention and protection program and includes guidance for all OPP facilities to develop site-specific plans.

1.2. These procedures are designed to protect participants from risks associated with emergency events, which could result in an injury or fatality.

1.3. If in a location where OSHA has no jurisdiction, and compliance with a requirement is not feasible due to the environment, unavailability of equipment, or other reason, a waiver or variance may be requested using the Authority Having Jurisdiction (AHJ) process.

1.4. In the USAP, all facilities are owned by NSF OPP, and the prime contractor is obligated to ensure they are kept safe from fire risk. ASC Safety personnel shall ensure that fire hazards are corrected if local efforts are not effective. If ASC Safety cannot successfully correct a fire hazard, then the NSF OPP Safety Officer shall be notified, along with the USAP Authority Having Jurisdiction (AHJ).

2. References

- 29 CFR 1910.38, Emergency Action Plans
- 29 CFR 1910.39, Fire Prevention Plans
- The International Building Code (IBC)
- USAP Building Code (USAP-BC) USAP Existing Building Code (USAP-EBC) and USAP Fire Code (USAP-FC)

3. General Requirements

3.1. The only building fires that should be fought by program participants are small, incipient fires that can be readily put out by fire extinguishers (and only if personnel are so trained), unless a trained fire brigade is available on-site.

3.2. Contractors shall develop site-specific plans and procedures that minimize the risks of fire and maximize protection of all staff, program participants, and guests exposed to fire emergencies within the geographic areas and domains supported by their contract (See Paragraphs 4 and 5).

3.3. Operational fire prevention and protection shall comply with 29 CFR 1910.38 and 1910.39.

3.4. Construction engineering and maintenance engineering require compliance with the IBC, version in effect at the time of use.

3.5. Coordination shall be made with local emergency response units and/or fire stations.

3.5.1. In areas supported by local fire departments, facilities managers shall establish, memoranda of understanding with local fire departments for firefighting services

3.5.2. If there is no fire department at a research station, project site, field camp or other location where serious fire hazards exist, a fire brigade shall be proposed to the OPP program manager responsible for that location's research or operational support.

3.5. Emergency telephone numbers and reporting instructions shall be conspicuously posted.

3.6. An emergency evacuation plan shall be posted in all facilities.

3.7. Fire Protection

3.7.1. In accordance with International Fire Code (IFC) Section 906, portable fire extinguishers will be recharged and serviced as indicated by the manufacturer for the specific type of fire extinguisher. Record tags will be attached to all extinguishers and the dates they were inspected and weighed or recharged will be indicated thereon.

3.7.2. Participants who will be working in high-risk fire location (e.g., laundry facility, fueling station) shall be trained on the proper handling and operation of fire extinguishers.

3.7.3. Adequate firefighting equipment will be provided at temporary buildings and places where combustible materials are stored, as follows:

- Class A fire (wood, paper, textiles, rubbish): water or foam extinguisher.
- Class B fire (oil, grease, gasoline, and similar flammable materials): foam, carbon dioxide, or dry-chemical extinguishers.
- Class C fire (electrical): carbon dioxide or dry-chemical extinguisher.

3.7.4. Using carbon tetrachloride or chlorobromomethane as fire extinguishing agents is prohibited.

3.7.5. Where unusual fire hazards exist or emergencies develop, additional fire-fighting facilities, such as larger portable chemical units, fire pumps, fire hoses, and outside assistance shall be developed as necessary to ensure reasonable protection.

3.8. Electrical Safety for Fire Prevention

3.8.1. All electrical installations shall be accomplished in accordance with the current edition of the National Electrical Codes (up to one year after publication) unless the AHJ has otherwise approved a waiver.

3.8.2. Electrical devices and power strips shall follow a nationally recognized testing laboratory and identified as such (e.g., UL or CE).

3.8.3. Only qualified and competent individuals shall be exposed to arc flash hazards. Arc Flash hazards shall be identified based on survey by a qualified and competent person and labelled accordingly on outside of panels (High Voltage). Arc Flash risk shall be mitigated through use of LOTO (where possible) and wearing proper arc flash PPE.

3.9. Housekeeping Requirements

3.9.1. Excess stacks of paper, crating materials, packing boxes, and other combustibles shall be organized or cleared from buildings (when permissible) to limit accumulation of combustible debris.

3.9.2. All entrances, fire exits, stairs, halls, passageways, and electrical panels shall allow free, unrestricted passage always. No material or equipment of any type shall ever be placed or stored to block or restrict free access and egress (and at no time shall space for emergency egress be less than 28 inches).

3.9.3. Combustible cleaning materials shall be stored in closed metal containers. No combustible materials shall be stored beneath or stacked within three meters (10 feet) of buildings.

3.9.4. All rags, waste, and other items soiled by flammable or combustible materials shall be placed in tight or closed metal containers for daily disposal, when a flammable locker for storage of these is not available.

3.9.5. Incinerators used for burning municipal materials and industrial waste must allow for no visible paper ash to escape during use. These operations will only be utilized by personnel who have received training and have a certificate of training on file. PPE, such as gloves and safety glasses, will be worn when placing documents into incinerators and when removing ash with shovels. Incinerators should not be placed within 50 feet of ignition sources or buildings. The manufacturer's recommended operating instructions should be readily available to operators.

3.10. Smoking Requirements

3.10.1. Smoking is permitted only in approved locations.

3.10.2. Smoking is prohibited inside all OPP facilities aside from designated smoking shelters.

3.10.3. For this policy, smoking shall refer to the use of any of the following tobacco products:

- Any smoke or vapor-emitting product, including but not limited to cigarettes, cigars, cigarillos, and pipes
- Any smoke or vapor-emitting product or device designed or intended to simulate a tobacco product, including but not limited to e-cigarettes, but excluding gum and prescription medications.

3.10.4. Employees and visitors who wish to smoke must go outside the building to a spot at least 25 feet *downwind* from the door, unless designated smoking areas are available. The following smoking requirements shall be complied with:

- Smoking is prohibited inside any vehicle or heavy equipment.
- Smoking is allowed outdoors, except adjacent to building entrances and air intake ducts, and except where it presents a safety hazard, such as near fuel, explosives, and vehicle, aircraft, and small boat operations.
- Smoking near building entrances may be further restricted by station management to protect workers and visitors from tobacco smoke in the workplace. General guidance is that smoking is not allowed within 25 feet of building entrances.

- All materials used for smoking, including cigarette butts and matches, must be fully extinguished and disposed of in appropriate containers.
- For the USAP, designated indoor smoking shelters are provided at McMurdo and South Pole Stations.
- There are no indoor smoking areas at any field camp.
- Smoking is prohibited in any aircraft.

4. Fire Prevention Plans

4.1. A written fire prevention plan shall be available for each high-hazard location, as identified by the fire department or other qualified person with the requisite knowledge and training.

4.2. Fire prevention plans shall be reviewed annually and updated as needed.

4.3. The fire department shall be provided inventories of all hazardous material in the facility and a map showing storage locations, and fire department personnel shall be walked through the facility so they understand the layout and dangers should a fire occur.
4.4. All program participants shall be informed of the fire hazards of materials and processes to which they are exposed.

4.5. The plan shall include:

- A list of major work-place fire hazards.
- Storage and handling procedures for fire hazards, to include general housekeeping and procedures for the control of flammables and combustibles.
- Potential ignition sources and control procedures, to include smoking, cutting, grinding, and welding.
- A list of fire protection equipment and written procedures for its use.
- Standard operating procedures (SOPs) for specific maintenance operations that present unique fire hazards, such as hot work and confined space work.
- Title of personnel responsible for maintaining fire equipment and those responsible for fire hazards.
- Required maintenance and testing procedures -- and required frequency of maintenance and testing -- for all fire equipment and systems, e.g., CO2 systems, detectors, alarm systems.
- Designated parking spaces for emergency vehicles and firefighting equipment (at locations where these assets are available).

5. Evacuation Plans

5.1. Evacuation plans shall be reviewed annually and updated as needed.

5.2. The plan shall include:

- Response procedures to alerts and alarms.
- Notification procedures - fire department, supervisors, visitors. Include phone numbers.
- Evacuation routes, to include designation of safe locations outside of facility where employees would wait for further instructions. If a mezzanine is present without a secondary emergency exit and a throw ladder is being utilized to escape, this must be clearly communicated, and

signage placed at the access point to the mezzanine identifying this as the only way to escape if the stairs become blocked due to fire.
- Fire extinguishing activities, if required to egress safely (locations, training).
- Emergency escape procedures and escape route assignments.
- Procedures to account for all employees after evacuations have taken place.
- Drill requirements, to include evacuation and rescue operations.
- Responsible employees, such as fire marshals and coordinators, who can provide further information or explanation of duties under the plan.
- Fire reporting procedures, accident investigation procedures.

6. General Building Operational and Basic Structure Requirements (Minimums)

6.1. In every building or structure, exits shall be so arranged and maintained as to provide free and unobstructed egress from all parts of the building or structure at all times of occupancy. No lock or fastener shall be installed to prevent free escape from the inside of any building.

6.2. Every exit shall be clearly visible, or the route to it shall be conspicuously marked in such a manner that every occupant of every building or structure who is physically and mentally capable will readily know the direction of escape from any point. Any doorway or passageway that is not an exit, but could possibly be thought of as an exit, shall be so arranged or marked to prevent occupant confusion with actual fire exits. Every effort shall be taken to avoid occupants mistakenly traveling into dead-end spaces during a fire.

6.3. Where hazardous processes or storage are of such character as to introduce the potential for an explosion, explosion venting, or an explosion suppression system specifically designed for the hazard involved shall be provided.

6.4. Clearance of at least 45 cm (18 inches) shall be maintained between the top of stored material and sprinkler deflectors (if present).

6.5. Clearance shall be maintained around lights and heating units to prevent ignition of combustible materials.

7. Inspection Requirements

7.1. Contractors shall conduct monthly inspections that address life safety and fire protection compliance.

7.1.1. Facilities that do not meet safety and fire requirements shall be expeditiously corrected.

7.1.2. All deficiencies shall be reviewed quarterly until corrected.

8. Reports

8.1. Contractors shall provide the NSF OPP SOH Office a written report of all fires experienced by facility for each station annually.

8.2. Contractors shall provide a summary of their monthly inspections quarterly, inspections shall be address life safety and fire protection issues by facility for each station.

Section 14: Electrical Safety

1. Purpose and Scope

This section prescribes requirements, procedures, and policies for electrical safety to mitigate risk of electrocution. This section does not include control of hazardous energy (see section 7), Control of Hazardous Energy). Electrocutions are in OSHA's (Occupational Safety and Health Administration) "Fatal Four" (https://ehsdailyadvisor.blr.com/2019/05/oshas-fatal-four-leading-causes-of-fatalities-in-the-workplace/).

2. References

- 29 CFR 1910 Subpart S (Electrical Safety)
- 29 CFR 1926 Subpart K (Electrical Standards for Construction)
- NEC (National Electric Code)
- EM 385-1-1, USACE Safety and Health Requirements Manual
- NFPA 70E (Standard for Electrical Safety in the Workplace)

3. General Requirements

3.1. Responsibilities

3.1.1. It is a supervisor's responsibility to ensure that personnel are aware of their exposure to electrical hazards, are trained in how to prevent electrocutions to include proper use of appropriate PPE (Personal Protective Equipment), and ensure personnel comply with these requirements.

3.1.2. It is the responsibility of *personnel* to comply with all safety requirements and report unsafe situations, near miss or safety incidents to their supervisor promptly in accordance with Section 4, Mishap Reporting and Investigation.

3.1.3. Qualified Person (QP) is defined as someone with the training, experience, and verifiable credentials responsible for performing electrical work that complies with the National Electrical Safety Code (NESC), National Electric Code (NEC), National Fire Protection Association (NFPA), OSHA Occupational Safety and Health Administration (OSHA), and the United States Coast Guard (USCG). If the work being performed conflicts with the any of the codes listed above, the most stringent shall apply. Verifiable credentials consist of State, National and/or Local Certifications/Licenses that a Master or Journeyman Electrician may hold, depending on the work being performed, and should be identified in the appropriate JHA/AHA.

3.2. Emergency Plans and Procedures-Required Training

Employees exposed to shock hazard and those employees responsible for acting in case of emergency shall be trained in release methods for victims in contact with exposed energized electrical conductors or circuit parts. Employees shall be instructed in methods of first aid and emergency procedures, such as approved methods of resuscitation, if their duties warrant such training. Training and re-training of employees in approved methods of resuscitation, including cardiopulmonary resuscitation and automatic external defibrillator (AED) use, shall be certified by the employer as required by OSHA 29 CFR 1910.151 and NFPA 70E 110.2(c).

3.3. Isolation

3.3.1. Before work begins, a Qualified Person in charge shall ascertain by inquiry, direct observation and by instruments, whether any part of an electric power circuit (exposed or concealed) is located such that the performance of work could bring any person, tool, or machine into physical or electrical contact with it. This verification procedure shall be documented prior to work beginning.

3.3.2. All equipment and circuits to be worked on shall be de-energized before work is started. Personnel shall be protected by a Hazardous Energy Control Program (HECP) and procedures (i.e. lockout/tagout, blanking, positive means of blocking, grounding, etc.). Positive means shall be provided for rendering controls or devices inoperative while repairs or adjustments are being made to the machines they control. > See Section 7, Hazardous Energy Control Plan.

3.3.3. If work MUST be performed on an energized system, then the employer must first demonstrate that de-energizing introduces additional or increased hazards (i.e., interruption of life support equipment, removal of light for an area, etc.) or is infeasible due to equipment design or operational limitations (i.e., testing, troubleshooting, etc.) and provide that justification to the NSF OPP prior to the start of work (outside of emergency conditions).

3.3.4. Energized work may never be performed without prior authorization. Once it has been determined that equipment must be worked on in an energized condition, an energized work permit shall be submitted to the Government Designated Authority (GDA) for acceptance (See NFPA 70E). Permits must be prepared in advance and include, as a minimum:

- Description of work and location;
- Justification for why the work must be performed in an energized condition;
- Description of work practices to be followed;
  - An electrical shock analysis and boundaries (safe working distances);
  - Arc flash hazard analysis and arc flash boundary determination;
  - Identification of PPE necessary to safely perform the task;
  - Means to restrict access of unqualified persons in work area;
  - Evidence of completing the job briefing (includes safety, tools, PPE, any other hazards and controls).
- Live parts of wiring or equipment shall be guarded to protect all persons or objects from harm.
- High voltage equipment (i.e., switchyards, transformers, etc.) shall be protected from unauthorized access. Entrances not under constant observation shall be kept locked; metallic enclosures shall be guarded and signs warning of high voltage and prohibiting unauthorized entrance shall be posted at entrances.
- Enclosure gates or doors shall swing outward or provide clearance from installed equipment.

3.4. Arc Flash

3.4.1.Whenever work on or near energized parts greater than 50 volts is necessary, a hazard analysis /arc flash hazard analysis will be conducted in accordance with NFPA 70E. The flash protection boundary, approach distances, hazard/risk category and personal protective equipment (PPE) requirements shall be identified.

3.4.2. PPE that provides appropriate arc flash protection is required for all personnel working on or near exposed energized electrical equipment operating at 50 volts or more. Identification of required PPE is based on equipment arc flash labels or NFPA 70E task tables.

3.4.3. Garments, to include fall protection harnesses, worn over arc rated protective clothing, must also be arc rated.

3.4.4. All personnel entering the identified arc flash protection boundary must be Qualified Persons as defined by OSHA and properly trained in NFPA 70E requirements and procedures. Unless permitted by NFPA 70E, Article 130.4, no Unqualified Person shall be permitted to approach nearer than the Limited Approach Boundary of energized conductors and circuit parts. Training must be administered by an electrically qualified source and documented.

3.5. Overcurrent Protection, Disconnects and Switches

3.5.1. All circuits shall be protected against overload.

3.5.2. Access and working space shall be provided and maintained around all electrical equipment to permit ready and safe operation and maintenance in accordance with NFPA70, Article 110.26, Spaces About Electrical Equipment. Where required clearance is not feasible, procedures shall be in place to ensure sufficient clearance is maintained for fully opening the door and/or servicing the electrical enclosure.

3.5.3. Disconnecting means shall be located or shielded so that persons will not be injured when the disconnect is operated. Disconnecting means shall be capable of accepting a lock and of being locked in the open (de-energized/off) position.

3.5.4. A readily accessible, manually operated switch shall be provided for each incoming service or supply circuit.

3.5.5. Grounding: All electrical circuits, equipment and enclosures shall be grounded in accordance with the NEC and NESC to provide a permanent, continuous and effective path to ground unless infeasible (e.g., facility on hundreds of feet of snow and ice). In such cases where grounding is infeasible, a hazard analysis needs to demonstrate equivalent protection through other means and be documented.

3.5.6. Ground-Fault Circuit Interrupter (GFCI) devices shall be calibrated to trip within the threshold values of 5 ma +/- 1 ma as specified in UL Standard 943. GFCI devices shall be tested before initial use and before use after modification.

3.6. Work Near Energized Overhead Lines

3.6.1. Work activity adjacent to overhead lines shall not be initiated until a survey has been made (and documented) to ascertain the safe clearance from energized lines.

3.6.2. Any overhead line shall be considered energized unless the person owning such line certifies that it is not energized, and it has been visibly grounded and tested.

Section 15: Vehicles, Machinery, and Equipment

1. Purpose and Scope

1.1. This Section establishes the requirements for contractors and program partners' operations of Vehicles, Machinery, and Equipment while working under the jurisdiction of the National Science Foundation (NSF), Office of Polar Programs (OPP), and its geographic areas of operation and domain.

1.2. The polar environment presents an additional risk of injury or fatality when operating vehicles, machinery, and equipment. The extreme cold can hamper control and function, presenting challenges with traction and braking and present hazards, including crevasses and sea ice present in the polar environment. The purpose of this section is to mitigate risk.

1.3. This policy applies to all vehicles, machinery, and equipment owned by OPP or operated in support of OPP operations. Compliance with federal, state and host nation laws are also required, with the most stringent requirements prevailing.

2. General Requirements

2.1. All operators shall be trained and qualified (verified by an electronic record, license, certificate, and/or permit) to operate vehicles, machinery, all-terrain vehicles (ATVs), unmanned vehicles (UVs), or other specialty (snow) vehicles.

2.2. Vehicles, machinery, and equipment not meeting safe operating conditions shall be immediately removed from service, its use prohibited until unsafe conditions have been corrected, and re-inspected before being placed in service.

2.3. A copy of the operator’s manual will be kept by the contractor at the issuing center and be available for review on request.

2.4. The number of passengers shall not exceed the number that can be safely seated per manufacture instructions.

2.5. Operating Rules

2.5.1. Operators are strictly prohibited from operating vehicles or equipment under the influence of alcohol or other substances that may impair an operator’s capacity to use such vehicles or equipment.

2.5.2. If equipped, all operators and occupants of vehicles or equipment must wear seatbelts unless specified otherwise in the manufacturer’s operating manual and justified in a JHA/AHA.

2.5.3. Cellular phones shall not be used while operating a vehicle unless with hands-free function or devices.

2.5.4. Text messaging while operating a vehicle is strictly prohibited.

2.5.5. Smoking in vehicles or equipment is prohibited.

2.5.6. Using portable headphones, earphones, or other listening devices while operating a vehicle or equipment is prohibited. An exception is permitted for operational purposes to facilitate communications that have hearing protection w/ microphones and speakers to integrate with radios.

2.5.7. Getting on or off any vehicle while it is in motion is prohibited.

2.5.8. Whenever vehicles, machinery, and equipment are parked, the parking brake, if equipped, shall be set.

2.5.9. Vehicles, machinery, and equipment parked on an incline shall have the wheels chocked and the parking brake set.

2.5.10. Global Positioning Systems (GPS) shall be used when leaving established roadways.

2.5.11. Driving above the speed limit is prohibited.

2.5.12. No vehicle or combination of vehicles or equipment hauling unusually heavy loads shall be moved until the driver has been provided with the required permits (as applicable), the correct weights of the vehicles and load, and a designated route to be followed.

2.5.14. When maneuvering or performing back-up operations, operators will take precaution. If a signal person or spotter is not used (or not available), operators will walk behind their vehicle or equipment to view the area for possible hazards or obstructions before performing back-up operations.

2.5.15. Personnel who are involved in vehicle incidents shall be evaluated for medical fitness by a medical professional (paramedic or nurse, at a minimum) before returning to duty. Vehicle incidents occurring in locations without medical support would be exempt from this policy, but operators should consider obtaining a medical evaluation upon returning to an area where medical support is available. The employee shall not be responsible for paying for this medical clearance, where payment is expected.

3. Roles and Responsibilities

3.1. Each operator is responsible for operations under their direct control. Whenever there is a safety concern, he/she shall have stop work authority until the unsafe condition has been reasonably mitigated.

3.2. Supervisors shall suspend or revoke operator privileges if operators fail to maintain qualifications or demonstrate carelessness or unsafe behavior in operation of equipment.

4. Training

4.1. Proof of qualification and/or competency to use equipment (such as a certificate or permit) shall be available for government review at the work location.

4.2. Only trained, qualified/certified and designated operators shall be permitted to operate a powered industrial truck (PIT). Qualification shall be in writing via a license, permit or other documentation.

4.2.1. Training must be both classroom and practical operation and in accordance with OSHA Standard 29 CFR 1910.178. It must be on the same type of truck the operator uses on the job.

4.2.2. The employer must certify that the operator has been trained and evaluated as required by the standard. The certification shall include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.

4.3. Members of drilling crews shall be provided training based on the equipment operating manual and the JHA/AHA. This training shall include, at a minimum,

- The operation, inspection, and maintenance of the equipment.
- The safety features and procedures to be used during operation, inspection, and maintenance of the equipment.
- Overhead and underground hazards.

4.4. For snowmobiles, ATVs, or other types of specialty vehicles, a driver qualification and training program shall be established specific to the vehicle. In addition, a SOP that includes, at a minimum, safe operations, limits of operational work areas, required PPE (such as helmets, which are required for snowmobiles and ATVs), and vehicle safety equipment requirements shall be established for all such vehicles.

5. Equipment and Systems

5.1. Seat belts: Seat belts and anchorages meeting the requirements of 49 CFR 571 shall be installed and worn in all motor vehicles (installation on buses is optional).

5.1.1. Seatbelts that have been damaged or removed shall be replaced immediately and meet the requirements of 49 CFR 571 and/or Society of Automotive Engineers (SAE) Standard J386.

5.2. Lights

5.2.1. All vehicles shall have functioning headlights and taillights.

5.2.2. When visibility is limited or when work is conducted in darkness, additional portable lighting shall be utilized where practicable.

5.3. Guarding and Safety Devices

5.3.1. All belts, gears, shafts, pulleys, sprockets, spindles, drums, flywheels, chains, or other reciprocating, rotating, or moving parts of equipment shall be guarded when exposed to contact by persons or when they otherwise create a hazard.

5.3.2. All hot surfaces of equipment, including exhaust pipes or other lines, shall be guarded or insulated to prevent injury and fire.

5.3.3. Platforms, foot walks, steps, handholds, guardrails, and toe boards shall be designed, constructed, and installed on machinery and equipment to provide safe footing and access ways.

5.3.4. Equipment shall be provided with suitable working surfaces of platforms, guardrails, and hand grabs. Platforms and steps shall be of nonskid material.

5.3.5. No guard, safety appliance, or device shall be removed from machinery or equipment, or made ineffective, except for making immediate repairs, lubrications, or adjustments, and then only after the equipment has been de-energized and a hazardous energy control program (lockout/tag-out) implemented. All guards and devices shall be replaced immediately after repairs and adjustments are completed and before power is turned on.

5.4. Reverse Signal (Back-Up) Alarm

5.4.1. All self-propelled construction and industrial equipment, dump trucks, and cargo trucks for which the trailer/body permanently blocks the view to the rear, whether moving alone or in combination, shall be equipped with a back-up alarm.

- Equipment designed and operated so that the operator is always facing the direction of motion does not require a back-up alarm.
- Commercial cargo vehicles (such as pick-up trucks, utility cargo or tool trucks, and flatbed cargo trucks intended for roadway use) that have a normally clear view through the rear window are not required to have back-up alarms. If the view is temporarily obstructed by a load or permanently blocked by a utility or toolbox or other modification, then a signal person may be used if the value outweighs the risk, as determined by an JHA/AHA. In lieu of a signal person, a backup alarm must be installed.

5.4.2. Back-up alarms shall be audible and sufficiently distinct to be heard above surrounding noise level.

5.4.3. Alarms shall operate automatically upon commencement of backward motion and shall operate throughout the entire backward motion.

5.4.4. Removing or disabling a back-up alarm is strictly prohibited.

5.5. The glass used in vehicles, machinery, and equipment windshields or cabs shall be safety-rated. If safety glass is unavailable for immediate replacement, safe alternatives shall be utilized, such as plexiglass.

5.6. All powered industrial trucks (PIT), commonly called forklifts or lift trucks shall be equipped with substantial overhead protection; guards that meet the structural requirements defined in ANSI/ASME B56.1.

5.7. Falling object protective structures (FOPS)

5.7.1. All bulldozers, tractors, or similar equipment used in clearing operations shall be provided with guards, canopies, or grills to protect the operator from falling and flying objects, as appropriate to the nature of the clearing operations.

5.7.2. Falling Object Protection (FOP) for other construction, industrial, and grounds-keeping equipment will be furnished when the operator is exposed to falling object hazards.

5.7.3. FOPs will be certified by the manufacturer or licensed engineer as complying with the applicable recommended practices of SAE Standards J231 and J1043.

5.8. Rollover Protective Structures (ROPS) shall be installed on:

5.8.1. Tracked and rubber-tire tractors including dozers, push and pull tractors, winch tractors, self-propelled pneumatic earth movers, front-end loaders, backhoes, rollers, and compactors.

5.8.2. ROPS are not required on: Trucks designed for hauling on public roads, self-propelled rollers, and compactors (type that do not have an operator's station).

5.8.3. ROPs will be certified by the manufacturer or licensed engineer as complying with applicable SAE Standards (i.e., J167, J1040, J1042, J1084, and J1194).

5.9. Drilling equipment

5.9.1. Drilling equipment shall be equipped with two easily accessible emergency shutdown devices, one for the operator and one for the helper.

5.9.2. Rigs must be shut down before any helpers enter a barricaded area.

5.9.3. Auger heads must be in the hole, or a cover placed over the hole before workers enter the barricaded area. Note: If infeasible due to type of drill equipment being used, a risk assessment shall be performed by a Competent Person (CP) and documented in the JHA/AHA as to why this requirement is not practical. Identification of additional precautions and/or controls shall be identified to ensure an equal level of safety is being accomplished.

5.9.4. Outriggers shall be extended per the manufacturer's specifications.

5.9.5. When drilling equipment is operated in areas with the potential for classification as a confined space, the requirements of Section 8 shall be followed.

5.9.6. Drill crewmembers shall not wear loose clothing, jewelry, or equipment that might become caught in moving machinery.

6. Additional Measures

6.1. A safety tire rack, cage, equivalent protection, or process controls shall be provided and used when inflating, mounting, or dismounting tires on split rims or on rims equipped with locking rings or similar devices.

7. Inspection Requirements

7.1. Inspections, Tests, Maintenance, and Repairs

7.1.1. Qualified persons shall conduct inspections, tests, maintenance, and repairs according to the manufacturer's recommendations.

7.1.2. Before initial use, vehicles not otherwise inspected by a state or local authority shall be inspected by a qualified mechanic and determined to be in safe operating condition and compliance with all required vehicle safety standards. This one-time inspection shall be documented and available for review at the worksite.

7.1.3. All vehicles and equipment shall be inspected on a scheduled maintenance program.

7.1.4. Before each shift, the operators shall check vehicles and equipment to ensure the following parts, equipment, and accessories (as applicable) are in safe operating condition and free of apparent damage that could cause failure while in use:

- Service brakes, including trailer brake connections
- Parking system (hand brake)
- Emergency stopping system (brakes)
- Tires
- Horns
- Steering mechanism
- Coupling devices
- Seat belts
- Operating controls
- Safety devices (e.g. back up alarms and lights, fire extinguishers, first-aid kits, window punch, seatbelt cutter)
- Accessories, including lights, reflectors, windshield wipers, and defrosters, where such equipment is necessary

7.2. All motor vehicles shall be shut down prior to and during fueling operations.

Section 16: Load Handling Equipment and Rigging

This section is held for future development.

Section 17: Snowmobile and All-Terrain Vehicle

1. Purpose and Scope

1.1. This Section establishes the requirements for contractors and program partners' operations of snowmobile and all-terrain vehicles (ATV) while working under the jurisdiction of the National Science Foundation (NSF), Office of Polar Programs (OPP), and its geographic areas of operation and domain.

2. General Requirements

2.1. Only personnel requiring snowmobiles or ATVs for relevant activities that the supervisory chain approves shall use the equipment to support the mission, sustainment functions, or approved recreational activities.

2.2. All operations shall be per manufacturer’s instructions and recommendations. Equipment shall not be operated in a manner that will endanger persons or property nor shall the safe operating speeds or loads be exceeded.

2.3. A copy of the operator’s manual will be kept by the contractor at the issuing center and be available for review on request.

2.4. The number of passengers shall not exceed the number that can be safely seated per manufacture instructions.

2.5. Getting off or on any equipment while it is in motion is prohibited.

2.6. Inspections, tests, maintenance, and repairs shall be conducted by a qualified person in accordance with the manufacturer's recommendations.

2.7. Equipment not meeting safe operating conditions shall be immediately removed from service, its use prohibited until unsafe conditions have been corrected, and re-inspected before being placed in service again.

2.8. Guarding

2.8.1. All belts, gears, shafts, pulleys, sprockets, spindles, drums, flywheels, chains, or other reciprocating, rotating, or moving parts of equipment shall be guarded when exposed to contact by persons or when they otherwise create a hazard.

2.8.2. All hot surfaces of equipment, including exhaust pipes or other lines, shall be guarded, or insulated to prevent injury and fire.

2.8.3. No guard, safety appliance, or device shall be removed, or made ineffective, except for making immediate repairs, lubrications, or adjustments.

2.9. ATV’s tires shall be inflated to the pressures recommended by the manufacturer.

3. Roles and Responsibilities

3.1. Supervisors shall suspend or revoke operator privileges if operators fail to maintain qualifications or demonstrate a careless disregard in operation of equipment.

4. Training

4.1. Operators shall Complete all operational or safety training the manufacturer requires for the specific equipment used.

4.2. All operator training and evaluations shall be conducted by persons who have the knowledge, training, and experience to train the equipment operators and evaluate their competence.

5. Equipment and Systems

5.1. Helmets shall be always worn while operating a snowmobile or ATV.

5.2. All passengers shall wear helmets. This includes those on a sled towed by any snowmobile or ATV.

5.3. Helmets must be approved by the Department of Transportation (DOT) or Snell Foundation for snowmobile or ATV use.

5.3.1. Climbing and rigging helmets are permitted in limited circumstances for personnel in transit during tower inspections and maintenance. This exception shall be documented as part of a Job Hazard Analysis with recommended safe speeds for the selected equipment used

Section 18: Ships and Vessels

1.Purpose and Scope

The purpose of this section is to ensure that the risk of serious injury or fatality is mitigated in ship operations.

The policy applies only to the USAP.

2. General Requirements

2.1. Policy

- Ships and vessels meeting the United States Coast Guard (USCG) requirement for inspection shall maintain USCG compliance.
- All passengers shall receive a safety briefing before the vessel departs that covers potential hazards *such as the ship lurching forward or sideways during rough seas*, emergency procedures, and incident reporting requirements. This briefing shall be documented with passenger signatures indicating they understand.
- For cargo unloading and loading, a coordinated safety plan shall be developed with all the various stakeholders (e.g. New Zealanders, Navchaps, contractors), documented, and kept close to the dock for review if needed during operations. The plan shall also contain individual AHA's, broken out by activity, such as crane operations, rigging, and transportation. The enforcer of this plan is the onsite contractor. NSF expects that all organizations comply with the agreed-upon safety plan. Being that NSF will bear the burden for emergency support if a serious incident or fatality occur, NSF expects compliance with the contractor's safety requirements to include fall protection when workers are on top of containers. (See Accident Prevention Plans in Section 3.)

2.1.1. Lines

- Lines shall be carried to shore, with risk managed appropriately, and this decision shall be the captain's. The hierarchy of line carrying, from least risky to most risky is: 1) tossing by hand (if able), 2) carried across by small boat, 3) shot from gun, and 4) launched with rocket launcher. All weapon and explosive safety requirements shall be documented and enforced.
- Before shooting lines, clearance zones shall be established and maintained. At common access routes (walking or riding), signage warning personnel not to enter shall be in place.
- Personnel at tie-up points on shore shall be protected if line is being shot by gun or rocket launcher.
- Just before line shooting is to begin, and at a minimum 30 minutes prior, and where possible, a warning shall communicated broadly to all in the vicinity to follow the safety requirements on clearance zones or any other contractor-dictated safety precaution.

Section 19: Diving Standards (Antarctic Program Only)

1. Purpose and Scope

1.1. Diving is an activity that carries some risk, which can be mitigated through training and experience. Diving in Antarctica carries additional risks associated with the environmental conditions and the often-remote diving locations, where diving support, medical support, and life-support infrastructure are limited or absent. This policy and these standard operating procedures are intended to provide a framework by which underwater diving for both operations and maintenance (O&M) and scientific purposes can be conducted safely.

1.2. The Office of Polar Programs (OPP) of the Geosciences Directorate of the National Science Foundation (NSF) provides support for scientific diving associated with the research activities it funds. The OPP Standards for the Conduct of Scientific Diving have been developed to ensure that all scientific diving is conducted in a manner that will minimize scientific divers' exposure to risk for accidental injury or illness associated with diving, while optimizing the researchers' ability to conduct research. These Standards have been patterned after the American Academy of Underwater Sciences (AAUS) *Standards for Scientific Diving,* a document that has provided a template for scientific diving at most academic and research institutions in the United States over the last fifty years. The approach described in the AAUS standards has been recognized by the Occupational Safety and Health Administration (OSHA) as providing an effective means of protecting scientific divers (i.e., Code of Federal Regulations, 29.1910 Subpart T). Although OSHA does not have jurisdiction in Antarctica, the fact that the Scientific Diving Control Board and these Standards for the Conduct of Scientific Diving meet OSHA requirements for scientific diving helps ensure the scientific diving program provides a framework of safety consistent with scientific diving in the United States.

2. References

- 29 CFR 1910.401-440 and Subpart T
- AAUS Standards for Scientific Diving

3. General Requirements

3.1. There are inherent risks in diving and doing so in Polar Regions involves additional risks because of the environmental conditions and remoteness. These standards provide a structure within which to manage those risks and allow underwater diving in support of the scientific enterprise to proceed safely. Each scientific diver should acknowledge those risks and commit to conducting their underwater diving activities in accordance with this policy and directed procedures.

4. Responsible Authorities and Personnel

4.1. Safety and Occupational Health Officer (SOHO): The SOHO is responsible for the safety of all USAP participants and is the administrative position to which the SDCB and the DSO report. The SOHO has ultimate responsibility over all phases of the dive program and its management. The DSO exercises responsibility over all technical components of the scientific diving program.

4.2. Scientific Diving Control Board (SDCB): The SDCB is a committee appointed by the OPP director to oversee the operational details of the scientific diving program. Members of the SDCB are

selected based on their knowledge of and involvement in the scientific diving activities, preferably in Polar Regions. The SOHO, DSO, and the support contractor supervisor of diving services serve as non-voting, ex-officio members of the Board. The SDCB has the responsibility to:

- Recommend changes to policy, changes in procedure, and amendments to this policy and SOP as the need arises.
- Establish and/or approve training programs through which applicants can satisfy the requirements of this policy and SOP.
- Develop guidance for safe diving activities (e.g., procedures, locations, conditions) in Antarctica.
- Recommend new equipment or techniques for polar use; and perform other duties associated with USAP scientific diving, as listed in the SDCB charter.

4.3. OPP Diving Safety Officer: The OPP DSO acts as a liaison between the SDCB and the research divers. The DSO has the authority to act on behalf of the SDCB in all diving matters, pending acceptance by the SDCB at their next meeting. The DSO typically represents OPP in technical matters concerning diving operations, diving safety, or projects utilizing diving as a tool in their research. The DSO has the responsibility to:

- Review and approve divers, diving plans, and diving locations submitted by the various research projects.
- Evaluate and recommend equipment for polar diving use.
- Recommend facilities to support scientific diving in polar regions.
- Recommend new diving techniques or procedures to further scientific diving as a research tool in Antarctica.

4.4. Home Institution Diving Safety Officer: The home institution DSO oversees diving safety at the home institution, usually that of the principal investigator (PI), to which the scientific divers are affiliated. The home institution DSO acts in an advisory capacity to the OPP DSO, provides information on current scientific diver status under AAUS standards, and ensures that specialized training is provided to prepare individual divers for diving in Polar Regions. The home institution DSO certifies that the diver is current according to AAUS standards.

4.5. Contractor Supervisor of Diving Services: The supervisor of diving services is responsible for maintaining the OPP-owned dive equipment provided on-site, conducting diving pre-season orientations, orienting new science teams to conditions on-site, providing supervision and instruction during local familiarization dives, and generally supporting all scientific diving activities. The supervisor of diving services has the authority to suspend diving operations if in his or her opinion they are unsafe or unwise, pending review by the DSO. Other oversight duties, authorities, and responsibilities may be assigned this individual by the OPP DSO or the SOHO.

4.6. Principal Investigator (PI): Generally, the PI acts as the lead diver, unless that authority is assigned to another more experienced diver in the project. The PI is responsible for ensuring all divers meet this policy's requirements and the operational requirements of the project.

4.6.1. The PI is responsible for ensuring maintenance of project-owned scuba equipment within 12 months for the following items (unless they are provided by OPP):

- Regulator

- Buoyancy compensator
- Dry suit
- Dive computer and gauges

4.7. A project's lead diver is the person who has the diving experience, competency, responsibility, and reliability to conduct polar diving operations, and who has been designated responsible for managing the daily dive operations of the science team. The lead diver ensures that all divers in the team follow the procedures established in this policy and SOP.

4.8. Divers are the individuals having the experience, training, and authorization necessary to dive under the auspices of the OPP.

4.9. Tenders are individuals who are trained to assist divers in their diving activities. They have no direct responsibility to intervene in diving operations. Tenders are assigned and trained by the supervisor of diving services and/or project's PI or lead diver.

5. Scientific Diving Program Administration.

5.1. Scientific Diving Control Board (SDCB). The SDCB falls under the administrative management of the NSF OPP Safety Officer and needs budget approval before initiating any travel or other actions (such as diving) that expend resources.

5.2. The SDCB and Diving Safety Officer (DSO) have been appointed to assist OPP by providing the technical expertise necessary to operate a scientific diving program in support of OPP's polar research mission.

5.3. The SDCB members are primarily volunteers from other academic or research institutions, providing their expertise as "special government employees" during the period of their assignment.

5.4. Diving Eligibility. OPP-funded or sanctioned research projects or related educational outreach activities can request underwater diving privileges under the auspices of the OPP scientific diving program. Diving may be authorized if the dive project meets the definition of scientific diving (see above), the dive plan follows this policy and directed SOPs, the participating divers are authorized to dive, and the operational requirements of the dive project can be met within the resources available.

5.5. The OPP DSO will determine whether the dive plan and divers meet the requirements stipulated in this policy and SOP and can be authorized to dive. The NSF OPP Safety Officer and programs, operations, and logistics managers will determine whether the overall operational support requirements of the specific research project (including the underwater component) can be met within current resource constraints.

6. Diving Control

6.1. Diving Approval: Upon the recommendation of the supervisor of diving services, the DSO determines whether a specific project's dive plan is consistent with the requirements of this policy and SOP, based on the information submitted by the PI, and if so, approves the dive plan. Likewise, the DSO reviews each diver's credentials and approves or disapproves the diver, as appropriate.

6.2. All divers must meet the following criteria:

- Certification for one year, including rescue training.
- 50 open water dives.
- 25 dry suit dives.
- 10 dry suit dives within twelve months of Antarctic dive operations, with at least one dry suit dive logged within the last six months.
- Minimum depth certification of 100 feet of sea water (fsw) for the McMurdo area and 60 fsw for Palmer and research vessels, with at least one dive to the diver's maximum certification depth within the last twelve months.
- Current certification in first aid, cardiopulmonary resuscitation (CPR), and oxygen administration.

6.3. Rebreather Diving: For diving using rebreathers, divers must meet these additional criteria:

- Trained in the use of nitrox.
- Certified for one year on a rebreather, with a minimum of 25 open-water rebreather dives and a minimum of 25 hours underwater time.
- Certified on the type of rebreather to be used.
- A minimum of 12 open-water rebreather dives and a minimum of 12 hours underwater time on the rebreather to be used, while using a drysuit, in the past year.

6.4. Checkout Dives

Divers may be required to perform checkout dives with a party designated by the OPP DSO before deployment. Diving approval may be revoked for any diver who does not demonstrate proficiency during the in-situ familiarization dives conducted by the OPP DSO or supervisor of diving services in the field.

6.5. Oversight of Diving Activities

The SDS, the OPP DSO, and any member of the SDCB has the authority to suspend the diving privileges of any divers or dive team if, in his or her opinion, the divers are conducting themselves in a manner that is unsafe or inconsistent with this policy and SOP. Temporarily suspended diving privileges can be reinstated by the OPP DSO, subject to review by the SDCB and ultimate approval by the OPP SOHO.

6.6. Consequences of Violating Regulations

Failure to comply with this policy and SOP may be cause for revocation or restriction of a diver's authorization to dive anywhere in the OPP's area of responsibility and authority.

7. Policies and Regulation

7.1. Diver Qualifications

7.1.1. In no case will individuals be allowed to dive under OPP auspices unless they are trained and proficient in the type of diving they plan to do and familiar with the equipment that they plan to use.

7.1.2. Each diver shall have experience or training in the following:

- The use of instruments and equipment appropriate to the diving activity to be conducted.
- Dive planning and emergency procedures.
- CPR, diver rescue techniques, oxygen administration, and diving-related first aid.
- Diving-related physics and physiology and the recognition of pressure-related injuries.
- Any supplemental qualifications the SDCB may impose (e.g., the number of dry suit dives or other qualifications not required by AAUS).

7.2. Diver Health
No dive team member shall be permitted to dive for the duration of any known condition likely to adversely affect the safety and health of the diver or other dive team members.

7.3. Solo Diver Prohibition
All dives conducted under OPP auspices shall be executed in such a manner as to ensure that every diver involved maintains constant, effective communication with at least one other comparably equipped, certified scientific diver in the water, except as permitted below. This buddy diver system is established to provide mutual assistance, especially in the case of an emergency. Dives should be planned around the competency of the least experienced diver. If effective communication is lost within a buddy team, then all divers shall surface and reestablish contact.

7.4. Diving Under Ceilings

7.4.1. The dive access hole must be clearly marked by deploying a secured downline with flags and strobe lights, and the opening must be maintained to allow a normal exit from the water. If additional holes are required, they must be similarly marked and maintained.

7.4.2. Untethered diving is permitted, provided a downline is deployed and divers adhere to the buddy system, and provided diving is conducted in clear water with adequate visibility to permit clearly seeing the access hole or its downline from anywhere the divers will be during the course of the dive.

7.4.3. The use of a tendered tether is required when visibility restricts the diver from clearly seeing the access hole or downline, when shallow water restricts the diver's ability to see the entry hole, or if a danger is present.

7.4.4. Divers must carry with them two independent regulators: a primary and a backup.

7.4.5. These regulators may be attached to the same or to separate air sources.

7.4.6. A buoyancy compensator in conjunction with a dry suit is not required when diving with a downline that reaches the bottom at a diveable depth.

7.4.7. All dives must be tended. Additionally, during periods of darkness, at least two lights powered by independent sources must be in the hole.

7.5. Dive Computers and Pressure Gauges

All members of the diving team shall use an OPP-issued dive computer and a submersible, cylinder pressure gauge. Divers shall read and acknowledge understanding of the computer's manual, and all dives shall be planned and conducted within the computer's no-decompression limits.

7.6. Depth Limits

7.6.1. The diving certification issued by the diver's home institution will authorize the holder to dive to, but not exceed, his or her certification depth.

7.6.2. Individuals are authorized to dive to either their depth certification from their home institution or to a depth specified by the OPPDSO, whichever is shallower. Minimum depth certification for the McMurdo area is 100 fsw and for Palmer and research vessels is 60 fsw. Dives that require staged decompression are not authorized.

7.6.3. An OPP-authorized diver may only exceed his or her depth certification by one step under the following conditions:

- If supervised by a diver certified to a greater depth.
- If an emergency situation makes this necessary.

7.7. Diver Recall
A method of recalling the divers must be available at each dive site and understood by all divers and tenders.

7.8. Tended Diving with Communications
Single divers using surface-supplied, or tethered-scuba modes of diving may be deployed, provided the following requirements are met:

- A full-face mask or helmet is utilized
- The system has a positive, two-way, voice-communication link
- The system has a tether, air supply hose (if appropriate), and communication line
- The diver has received a dive plan authorization number from the OPP DSO for this mode of diving to be used
- A fully equipped stand-by diver who is able to enter the water expeditiously is present.

7.9. Special authorization by the OPP DSO is required for:

- Surface-supplied diving
- Blue-water diving
- Rebreathers (see Rebreather Standards, above, and Rebreathers, below)
- Mixed gases/oxygen enriched air (Nitrox)

8. Diving Operations and Plans

8.1. Working versus Scientific Diving
The USAP DSO or designee shall be responsible for determining whether dive operations are to be conducted as OSHA subject working dives or OSHA exempt scientific dives based on review of the dive plan. Questions such as those listed below will be used to determine the type of dive. Any negative answers would require the task to be conducted as a working dive.

- Can the tasks be accomplished using simple hand tools (e.g. small hammers, pliers, chisels, wrenches, cameras, measuring tapes, collection bags and jars)?
- Do the tasks require the expertise of a scientist or scientist-in-training?
- Can the tasks be accomplished with minimal physical exertion?
- Are the tasks limited solely to the observation of natural phenomena or responses of natural systems and/or gathering of data for scientific analyses?
- If any object is to be lifted or moved, is its weight underwater <100 pounds?
- Will the tasks result in the advancement of science?

8.2. Pre-dive Information: Dive Plans
Before conducting any diving operations, the PI must provide the following information in POLARICE or other communication option, as appropriate:

- The names of participating divers, their qualifications, and their depth certifications.
- The name, telephone number, and relationship of the person to be contacted for each diver, in the event of an emergency.
- The approximate number of proposed dives.
- The locations of proposed dives.
- The estimated depths and bottom times anticipated.
- The proposed work, the equipment and/or boats to be employed, whether repetitive dives will be required, and details on any hazardous conditions anticipated.

8.3. Lead Diver

For each dive, one individual shall be designated as the lead diver. He or she shall be at the dive site during the diving operation. The lead diver shall be responsible for:

8.3.1. Coordinating diving with other known activities in the vicinity that may interfere with the diving operation.

8.3.2. Briefing the dive team members on:

- Dive objectives.
- Any unusual hazards or environmental conditions likely to affect the safety of the diving operation.
- Any modifications to diving emergency procedures necessitated by the specific diving operation.
- The need to report immediately any physical problems or adverse physiological effects, particularly symptoms of pressure-related injuries.

8.3.3. Planning the diving operation, which shall include considerations of the safety and health aspects of the following:

- Diving mode.
- Surface and underwater conditions and hazards.
- Breathing gas supply.
- Thermal protection.
- Dive equipment.

- Dive team assignment.
- Residual inert gas status of dive team members.
- Decompression schedule and altitude corrections.
- Emergency procedures.

8.4. Tenders
All dives conducted under the auspices of OPP shall be tended by personnel who shall remain on-site and at the surface during the course of the dive, and who are trained to tend that specific type of diving activity. At a minimum, tenders must be aware of emergency response procedures for the specific dive site, diver recall procedures, methods of extracting an unconscious diver from the water, and the location and use of the emergency oxygen kit.

8.5. Pre-Dive Checks
Each diver shall conduct a pre-dive functional check of his or her diving equipment in the presence of the dive buddy or tender. This functional check shall include, but not be limited to, confirming that:

- The cylinder valve positively opens and closes.
- The submersible pressure gauge works and registers the expected amount of air in the cylinder.
- The in-line shut-off valve on the primary regulator is in the open position.
- There is adequate air delivery and an absence of free flow (by inhaling but not exhaling on both primary and backup regulators).
- The dry suit inflator valve delivers air without free flow, and the dry suit exhaust valve vents air when open.
- The buoyancy compensator inflator valve delivers air without free flow, and the exhaust valve vents air when open.
- The integrity of mask and fin straps.
- Any other gear operates according to specifications or expectations.

8.6. Refusal to Dive
It is the diver's responsibility and duty to refuse to dive if in his or her judgment conditions are unfavorable, or if he or she would be violating the precepts of his or her training, USAP diving standards, or his or her home institution's diving manual.

8.7. Agreement to Dive
No dive team member shall be required to be exposed to hyperbaric conditions against his or her will, except when necessary to prevent or treat a pressure-related injury.

8.8. Terminating the Dive

8.8.1. A diver may terminate a dive at any time if he or she feels it would be unsafe to continue. Divers should begin terminating their dives by notifying their buddies of the termination, stopping work, and commencing ascent. Divers must be at their safety stops with no less than 20 cf of air (see Table 1) and must have exited the water with no less than 10 cf.

8.8.2. Examples of situations necessitating dive termination include:

- Environmental conditions that become unsafe.

- One or more divers becomes chilled.
- Cylinder gas volume approaches 20 cubic feet.
- Dive profiles approach required stage decompression.
- Equipment failure that immediately or potentially jeopardizes the safety of the diver.

Table 1: Minimum reserve pressures for selected cylinder configurations (cf = cubic feet; psig = pounds per square inch gauge).

Cylinder Type (cf)	Pressure at 20 cf (psig)	Pressure at 10 cf (psig)
Single Steel 95.1	600	300
Single Steel 110	500	250

8.9. Equipment Requirements

8.9.1. A functional oxygen kit shall be present at the dive site for every dive, and all participating divers and tenders shall be trained in its use.

8.9.2. Each diver shall have a submersible pressure gauge that measures scuba cylinder pressure and can be monitored by the diver during the dive.

8.9.3. Each diver shall have the capability of achieving and maintaining positive buoyancy.

8.10. Post-Dive Safety Checks
After completing a dive, each diver shall report any physical problems, symptoms of decompression sickness, or equipment malfunctions to the lead diver, PI, and the SDS.

8.11. Emergencies - Deviation from Regulations
Any diver may deviate from the requirements in this policy and SOP to the extent necessary to prevent or minimize a situation that is likely to cause death, serious physical harm, or major environmental damage. A written report of such actions must be submitted to the OPP SOHO, supervisor of diving services, and DSO explaining the circumstances and justifications for such action. Potentially dangerous diving incidents must be communicated to the on-site divers as soon as possible.

9. Dive Record Requirements

9.1. Personal Diving Log
Each diver shall log every dive. Completed log sheets shall be submitted to the supervisor of diving services or other approved representative, who will forward them to the DSO. If an emergency causes a diver to incur a staged decompression obligation, this shall be noted in the log. The log shall be in a form specified by OPP and shall include at least the following:

- Dive date.
- Names of diver and partner.
- Total dive time.
- Maximum depth attained.
- Location of dive.

- Dive computer used.
- Regulator used.
- Mixed gas composition and tables, if used.
- Mode of diving (scuba, surface supply).
- Safety stop depth and time.
- Any accidents, equipment failures, or dangerous incidents occurring during the dive.

9.2. Record Maintenance
The supervisor of diving services and USAP shall maintain records for each authorized scientific diver, including these items for at least the specified period:

- Record of dive - one year, but five years if there has been a pressure-related injury.
- Pressure-related injury assessment - five years.
- Records of hospitalization - five years.
- Equipment inspection and testing records - current entry or tag, or until equipment is withdrawn from service.

9.3. Availability of Records
Institutional DSO's are required by AAUS standards to maintain certain permanent records. Divers must agree to the release of that information deemed necessary for the DSO to make a reasonable safety and health judgement regarding the diver's qualifications to dive. Failure to provide sufficient information may result in the denial of the OPP diving authorization.

10. Dive Accident Reporting

10.1. The diving program has an official and valid interest in all diving incidents and accidents. Analysis of incidents is important so that causes can be determined and corrected to prevent future occurrences and/or injuries that may impact diving readiness and authorizations.

10.2. The supervisor of diving services and/or McMurdo or Palmer Station medical personnel shall report to the DSO any diving-related injury or illness that requires any dive team member to be hospitalized for 24 hours or more, or any episode of unconsciousness related to diving activity. The circumstances of the incident and the extent of any injuries or illnesses shall be specified to the extent allowable by patient privacy regulations, taking into account the program's legitimate requirement to know the physical readiness of all divers to safely dive.

10.3. The DSO shall maintain these records, which shall also contain:

- A description of symptoms - including depth and time of onset.
- A description and results of treatment.
- A printout of the relevant dive computer profile(s).
- A dive history for the previous seven days.
- Any history of flying within those seven days.
- The supervisor of diving services and the DSO shall prepare a report of any diving accident requiring recompression or resulting in a serious injury, e.g., decompression sickness or gas embolism, and shall notify the OPP SOHO and the diver's home institution DSO.
- Incidents that do not involve injuries, e.g., free-flows and other equipment malfunctions, shall be recorded in the dive log.

11. Diving Equipment

11.1. Equipment Maintenance

The USAP issues regulators and dive computers for use by scientific divers. This equipment shall be maintained according to manufacturer's specifications. The PI is responsible for ensuring that all grantee-owned scuba equipment has been provided regular maintenance within the past 12 months.

11.2. Equipment Inspection

All inspections, tests, maintenance, and record keeping referred to in this section must be performed by the supervisor of diving services or other approved individual.

11.3. Equipment Records

Each equipment modification, repair, test, calibration, or maintenance service shall be logged for the equipment listed below. The logs shall include the date and nature of work performed, serial number of the item, and the name of the person performing the work. Equipment includes:

- Compressors
- Regulators
- Scuba cylinders
- Diving helmets
- Gas control panels
- Air filtration systems
- Submersible pressure gagues
- Depth gagues
- Cylinder valves
- Dive computers
- Air storage cylinders
- Dry suits

11.4. Breathing Masks and Helmets

Breathing masks and helmets shall have:

- A non-return valve at the attachment point between helmet or mask hose, which shall close readily and positively.
- An exhaust valve.
- A minimum ventilation rate capable of maintaining the diver at the diving depth.

11.5. Rebreathers

11.5.1. Only those models of rebreathers specifically approved by the DCB shall be used.

11.5.2. Current service records of the rebreather must be submitted to the DCB.

11.5.3. Divers must carry sufficient bailout, configured in a way to make it available to self or buddy, to allow egress from the water from any point in the planned dive.

11.5.4. Oxygen partial pressures shall not exceed 1.4 atmospheres at depths greater than 30 fsw, or 1.6 at depths less than 30 fsw.

11.5.5. All dives will be within the no-decompression limits of the unit.
11.5.6. CO_2 scrubbers will only be used for a maximum of one-half the manufacturer's recommended time limit.

11.6. Scuba Air Cylinders

11.6.1. Shall be designed, constructed and maintained in accordance with provisions of the applicable Unfired Pressure Vessel Safety Orders.

11.6.2. Must be hydrostatically tested in accordance with Department of Transportation (DOT) standards.

11.6.3. Must have an internal visual inspection before they are issued for use, and thereafter at intervals not to exceed 12 months, or sooner if they are suspected of having internal moisture.

11.7. Cylinder valves shall be functionally tested at intervals not to exceed 12 months.

11.8. Backpacks and weight systems shall be regularly examined by the persons using them. When used in open water, all weight systems and scuba backpacks worn by the diver shall be equipped with quick release devices designed to permit jettisoning of the gear. The quick release device must operate easily with a single motion from either hand.

11.9. Pressure Gauges shall be inspected and tested before the first use of the season, and thereafter as necessary.

11.10. First Aid Supplies
Both oxygen and a first-aid kit adequate for the diving operation shall be available at the dive location. When used in a hyperbaric chamber or bell, the first-aid kit shall be suitable for use under hyperbaric conditions.

11.11. Underwater Tools
Hand-held electrical tools and equipment used under water shall be specifically approved for this purpose, and they shall not be supplied with power until requested by the diver.

11.12. The use of specialized equipment, such as listed here, must be approved by the USAP DSO: Lift bags, underwater power tools, air lifts, come-alongs, underwater propulsion vehicles (scooters), and any equipment connected to the surface with an airline or load line. Oxygen cylinder filling for rebreathers requires special training from the Diving supervisors.

12. Breathing Air Standards

12.1. Breathing air for scuba shall meet Compressed Gas Association (CGA) Grade E air quality standards.

12.2. Compressor Systems

12.2.1. Low pressure compressors used to supply breathing air shall be equipped with a volume cylinder, with a check valve on the inlet side, a pressure gauge, a relief valve, and a drain valve.

12.2.2. Compressed air systems over 500 psi shall have slow-opening shut-off valves.

12.2.3. All air compressor intakes shall be located away from areas containing exhaust or other contaminants.

12.3. Compressor Operation and Test Records

12.3.1. Gas analysis and air tests shall be performed on breathing air compressors by the supervisor of diving services or other approved representative at regular intervals of not more than 100 hours of operation or 6 months, whichever occurs first. The results of these tests shall be entered in a formal log and be maintained by the supervisor of diving services.

12.3.2. A log shall be maintained by the supervisor of diving services or other approved representative showing any operation, repair, overhaul, filter maintenance, or temperature adjustment for each compressor.

12.4. Oxygen Safety

12.4.1. Equipment used with oxygen or mixtures containing over forty percent (40%) oxygen by volume shall be designed and maintained for oxygen service.

12.4.2. Components (except umbilical) exposed to oxygen or mixtures containing over forty percent (40%) oxygen by volume shall be cleaned of flammable materials before being placed in service.

12.4.3. Oxygen systems over 125 psig shall have slow-opening shut-off valves.

13. Construction or O&M Diving

13.1. Background

Though not as frequently executed as scientific diving, there are occasions where O&M or even construction diving is required. This type of diving presents additional hazards as compared to scientific diving, such as underwater welding, crane hazards, electrical hazards, and pressure differentials that create sucking forces, among others. Many of these hazards require lockout/tag-out procedures.

13.2. Procedures

13.2.1. Compliance is required with all requirements in 29 CFR 1910.410.

- Commercial SCUBA air diving with one diver in the water requires a minimum of three dive-team members: a designated person-in-charge (DPIC) (see 29 CFR 1910.410(c)), a standby diver (see 29 CFR 1910.424(c)(1)), and a line-tended diver (see 29 CFR 1910.424(c)(2)). Commercial SCUBA diving with two divers in the water requires a minimum of four dive-team

members: a DPIC (see 29 CFR 1910.410(c)), a standby diver (see 29 CFR 1910.424(c)(1)), and two divers (see 29 CFR 1910.424(c)(2)).

- Commercial surface-supplied air diving to 100 feet with one diver in the water requires a minimum of three dive-team members: a DPIC (see 29 CFR 1910.410(c)), and a diver "who shall be continuously tended [by a tender other than the DPIC] while in the water" (see 29 CFR 1910.425(c)(1)). For surface-supplied air diving that is 100 feet or less and does not involve planned decompression, a standby diver is not a specified requirement for every dive. We operate with a three-person team: One DPIC (Diving Supervisor), one suited standby diver, and one working diver.

13.2.2. All administrative steps required for scientific diving shall also be complied with for O&M and construction diving, to include submission of a dive plan to the OPP Diving Safety Officer for review and acceptance before the dive. A job hazard analysis (JHA) shall be completed for each working dive and shall be reviewed by the dive supervisor on-site before the dive. All members of the dive team shall sign the JHA, indicating they understand the hazards and the controls that will be utilized to mitigate risk. For *emergent diving* needed asap due to severe risk to life, life critical property, or severe environmental loss, a JHA shall be developed and provided to the local safety office, the NSF Rep, and NSF Station Manager for awareness. If none of those parties are available, the Dive Log, JHA, and short justification statement shall be emailed into the NSF OPP Diving Safety Officer as soon as reasonably possible after the dive for an after-action review.

13.2.3. Safety training, as required by OSHA for specific activities, such as welding and lockout/tag-out, shall be provided to dive team members as needed, and it shall be documented. In addition, the divers must have experience performing similar types of underwater work in the past, e.g., welding.

14. Definitions

American Academy of Underwater Sciences (AAUS): The national association of scientific diving scientists, diving technicians, and diving safety officers that is generally responsible for setting standards for scientific diving.
Buddy diver*:* Second member of the dive team.
Certified diver*:* A diver who holds a current certification from an AAUS scientific diving program or recognized certifying agency.
Closed-circuit rebreather*:* A type of scuba equipment that recirculates all of the exhaled breathing gas.
Cylinder*:* A pressure vessel for storage of gases.
Decompression sickness (DCS)*:* A condition with a variety of symptoms that may result from gas and bubbles in the tissues of divers after pressure reduction. DCS can be caused by exceeding no-decompression limits or exceeding the prescribed rate of ascent.
Depth*:* The dive log should denote the maximum depth of the dive.

Depth Certification: The depth to which a diver is certified to dive.
Dive: A descent into the water, an underwater activity utilizing compressed gas, an ascent, and return to the surface.
Dive computer: An electronic device for tracking depth and time and computing inert gas uptake and off-gassing.
Dive site: The physical location of a dive.

***Dive table**:* A profile or set of profiles of depth-time relationships, including their ascent rates, for particular breathing mixtures, to be followed after a specific depth-time exposure or exposures. (Synonymous with Decompression Table.)
***Dive team**:* Divers and support individuals who are exposed to or control the exposure of others to hyperbaric conditions.
***Diver**:* An individual in the water who uses an apparatus that supplies breathing gas at ambient pressure.
***Diving mode**:* A type of diving requiring specific equipment, procedures, and techniques; for example, scuba, surface-supplied air, or mixed gas.
***Diving Safety Officer (DSO)**:* Individual with scientific diving expertise responsible for advising the OPP on scientific diving matters, authorizing dive plans, and authorizing divers to dive under OPP auspices.
***Dry suit**:* An exposure suit with airtight seals at the neck and wrists, which allows the introduction and exhaust of compressed air through valves and keeps the diver dry during the dive.
***Hyperbaric**:* A condition defined by pressure greater than one atmosphere at sea level.
***Lead diver**:* A certified scientific diver with the experience and training to lead the diving operation.
***Mixed-gas diving**:* A diving mode in which the diver is supplied in the water with a breathing gas other than air.
***No-decompression limits**:* The maximum depth and time parameters of a decompression algorithm for which staged decompression is not required.
***Open water**:* Water not covered by a ceiling, ice or otherwise.
***Principal investigator (P1)**:* The scientist in charge of a science project, usually the senior scientist.
***Pressure-related injury**:* An injury resulting from pressure disequilibrium within the body as the result of hyperbaric exposure. Examples include decompression sickness, pneumothorax, mediastinal emphysema, air embolism, subcutaneous emphysema, and barotrauma.
***Recompression chamber**:* A pressure vessel for treating pressure-related dive accidents, such as cerebral arterial gas embolism (CAGE) and DCS. (Synonymous with Hyperbaric Chamber).
***Regulator**:* A device for delivering air from high pressure to ambient pressure, usually for breathing purposes.
***Scientific Diving Control Board (SDCB)**:* The group of individuals that act as an appointed body of expertise to OPP in all matters relating to scientific diving operations.
***Scientific diving**:* All diving performed by individuals necessary to and part of a scientific research or educational activity, in conjunction with a project or study under the jurisdiction of any public, private, or educational institution or similarly recognized organization, department, or group. To further clarify, OPP requires that:

- The underwater diving activity is an integral and essential part of the project.
- The project is a scientific, research, or educational activity consistent with OPP' s mission to foster research and education in the sciences and engineering,
- The specific tasks that the diver performs under water are observational or involved in data gathering, rather than tasks usually associated with commercial diving; and;
- The work products of the diving activity are available to the public for review or examination.

***Scientist**:* An individual who dives to conduct scientific operations which require specific knowledge and expertise in which the individual is fully qualified.
Scientist-in-Training: An individual who dives to conduct scientific operations which require specific knowledge and expertise, but whose science activities and diving are conducted under the direct or indirect supervision of a Scientist.

SCUBA diving (scuba)*:* A diving mode independent of surface supply in which the diver uses an open-circuit, self-contained, underwater breathing apparatus.
Supervisor of diving services*:* Individual with scientific diving expertise and logistical responsibilities, employed by the USAP Antarctic support contractor. He or she coordinates closely with the USAP DSO and safety and health officer to manage the USAP scientific diving program.
Surface-supplied diving*:* A diving mode in which the diver in the water is supplied from the surface with compressed gas for breathing, either from an air bank or from a compressor with volume cylinder.
Tender*:* A qualified person on the surface who is responsible for assisting and communicating with divers during a dive by various means, including a tether.
Tether*:* A line attached to a diver(s) to prevent their becoming lost underwater or under ice due to poor visibility or swift current. This is also a means of diver-to-surface communication.
Total Dive Time*:* Time from leaving surface to arriving back on surface. This is the time recorded in the USAP dive logs.
U.S. Antarctic Program (USAP)*:* An organization of the U.S. government made up of scientists and support personnel who carry out research that can only be done or best be done in Antarctica. The program comprises research by scientists selected from universities and other research institutions and operations and support by a contractor and other agencies of the U.S. Government. The National Science Foundation (the U.S. Government agency that promotes the progress of science) funds and manages the program through its Geosciences Directorate, Office of Polar Programs.
Working dives: Commercial diving as defined by OSHA under 29 CFR 1910, Subpart T, which involves tasks such as inspection of pipelines and outfalls, underwater welding, lifting heavy objects, and diving in contaminated water.

Section 20: Research Safety

1. Purpose and Scope

To minimize risk by NSF-funded activities, this section outlines expectations for conducting NSF-funded research. OPP expects researchers to follow federal guidelines, which include, but are not limited to:

- Transporting materials in accordance with DOT requirements.
- Adhering to lab safety regulations outlined by OSHA or other federal safety standards; unless a more stringent local requirement exists, for example in the contractor managed Chemical Hygiene Plan.
- Complying with all permitting requirements pertinent to their chosen field locations and research topics.

2. General Requirements

Home universities and institutions along with individual researchers are ultimately responsible for the safety of their research teams. This includes providing training to their research teams (outside of OPP-specific training conducted as part of the arrival process). OPP expects safety to be a top priority for all individuals participating in federally funded research. Additionally, OPP requires compliance with the following:

- All grantees shall comply with the OPP Code of Conduct. Non-compliance could result in removal from the Arctic or Antarctic.
- Research proposals shall be reviewed for safety integration by both the NSF OPP Safety Officer or designee and the contractor safety office. Risk shall be identified and recommendations made to the university or institution so that control measures can be implemented before the research teams deploy. This proactive approach to safety needs to be thorough and may require consultation with technical safety experts independent of the proposal process (e.g. radiation or drilling activities).
- Proposals shall include requests for a weapon or bear guard. Researchers who choose to bring their own weapons shall notify OPP prior to arrival. Grantees shall have taken an approved weapons training course specific to the weapon in question within the last three years. Weapons and ammunition shall be stored separately and in proper casing. Contractors shall develop relevant SOP's that, after OPP approval, shall be considered an extension of this policy.
- Any researchers using radioactive materials need approval by the qualified Radiation Safety Officer (RSO) at their home institution. Both the on-site laboratory manager and NSF OPP shall be made aware of this BEFORE the radioactive materials arrive on-site. Deviations from the NSF radioactive material authorizations are prohibited without prior approval of the Radiation Safety Officer from the grantee's home institution and the NSF OPP official. The NSF OPP Safety Officer will be kept informed of all matters involving radioactive materials.
- All accidents *shall* be reported in accordance with the accident reporting section, so that incident trends can be tracked to improve the safety of future researchers. Any concerns or reporting about safety can be done anonymously by directly contacting the NSF OPP Safety Officer by email or phone (jfentress@nsf.gov, (703) 292-7477). Incident information shall be

compiled and shared among research universities and institutions annually for awareness and trend analysis.

- When feasible, OPP field science managers, NSF Station Managers, and contractor safety (or contractor field safety) shall visit field research sites in order to spot check safety is being incorporated into daily research activities.
- Concerns regarding the appropriateness of safety rules and regulations are bound to arise between grantees, contractors, and federal employees working in the extreme environments of the Arctic and Antarctic. OPP expects that everyone involved with federally funded research actively engage in a culture of safety and prioritize a collective and continuous commitment to emphasize safety over competing goals. Further, if a safety requirement cannot be met or is not feasible, the research team can apply for a waiver or variance using the process identified (see Policy Cover) and by contacting the NSF OPP Safety Officer.

Section 21: Antarctic Field Safety

1. Purpose and Scope

1.1. The purpose of this section is to ensure that the risk of serious injury or fatality is mitigated in all field operations. Field operations in Antarctica are inherently dangerous activities. Field work carries additional risks associated with varying environmental conditions and remote settings often far from medical support. This policy and associated trainings, in support of it, are intended to provide a framework by which field operations can be conducted safely.

1.2. The term "field" in this section refers to all locations and camps outside of the three major stations, vessels, fixed traverse routes and local airfield complexes. Fixed large seasonal camps, hard walled camps and small ASC or grantee-staffed smaller camps are considered remote when supported by fixed or rotary wing, ground traverse platforms, skidoos or other approved ground transportation.

2. References

- USAP Field Manual Continental Version
- USAP Field Manual Peninsular Version
- USAP Basic Field First Aid
- Stay Healthy at Altitude in Antarctic
- 2018-2020 USAP Participant Guide

3. Field Operations

3.1. Grantee

All McMurdo-based field deploying grantee groups will undertake a mandatory risk assessment meeting with the field support supervisor, field-training supervisor, and SAR supervisor to identify, describe and mitigate where possible hazards present for a particular project. This meeting is documented and made available for the EOC and relevant departments in McMurdo. If the project is Marine/Palmer-based, grantees will conduct the risk assessment meeting with the peninsular field supervisor. It is the responsibility of the PI to ensure all required trainings and briefs depending on field location are completed by all members of the deploying field team.

3.2. Contractor

The contractor shall complete JHA or an Activity Hazard Analysis (Appendix D Forms) prior to field deployment activities. All documents related to anticipated field activities will be made available to the EOC upon request. The field management department shall develop, maintain, and ensure compliance with all relevant SOP's related to field operations.

3.3. All Participants

3.3.1. All USAP participants traveling to the field are responsible for having the appropriate and relevant field trainings. If a participant is unclear on what training is required for safe field operations, they should contact their POC, lead PI, hiring supervisor or applicable agency representative for clarification.

3.3.2. Courses are not intended to develop advanced field skills (such as mountaineering or traversing crevasse fields) in the inexperienced person. Rather, they familiarize proficient people with specific situations they might encounter in the Antarctic.

3.4. For USAP participants supported by other national programs the field safety policies of the relevant national program will be followed.

4. Training and briefings

4.1. Antarctic Field Safety
Those traveling off the established road network or off the recreational trail system are required to take this course every season. Additional trainings included in AFS are Helicopter Safety and Sea Ice Refresher. Helicopter Safety is required to ride in helicopters and consists of a video. Those working on the sea ice are required to take the Sea Ice Refresher portion of the course every year before traveling on the sea ice. Prerequisite: The participant must have taken the full sea ice class or the sea ice refresher within the past five seasons. If it has been longer than five seasons since the last refresher, the participant must take the full sea ice class again

4.2. Dry Valley Shakedown

4.2.1. This course is required by all those who will be working from self-supported field locations camping on dirt and/or ice. These are camps where no structures are already standing at put-in and food, water, and 24-hour heat are not provided by a separate crew.

4.2.2. This course is required every year.

4.3. Deep field Shakedown

4.3.1. This course is required by all those who will be working from self-supported field locations camping on snow. These are camps where no structures are already standing at the time of camp put-in and food, water, and 24-hour heat are not provided by a separate crew.

4.3.2. Required every year.

4.4. Crevasse Rescue Glacier Travel

4.4.1. Required by all personnel working on glaciers above the firn line and crevassed areas of an ice sheet or ice shelf. There are exceptions depending on the logistics, historical information, nature of glacier, and requirements of field work. The FST department will decide whether this course is necessary depending on specifics of study area.

4.4.2. Required every year.

4.5. Sea Ice Safety
Required by all USAP participants who will be traveling on the sea ice if this course or the Sea Ice Refresher training was taken more than five seasons prior.

4.6. Sea Ice edge safety

4.6.1. Required by all participants working at or near the ice edge.

4.6.2. Required every year.

4.7. Altitude Training

4.7.1. Required by all USAP participants traveling above 8,000 feet elevation without close support. Close support is defined as helicopter or fixed wing remaining at study site while field work is conducted.

4.7.2. Required every year.

4.8. Field Plan Risk Assessment

4.8.1. All grantee field teams will participate in a Field Risk Assessment process and final meetings with members from the Field department. The document summarizing this meeting needs to be completed and agreed on by all involved parties before departing to the field.

4.8.2. Required every year in support of Section 20, Research Safety.

4.9. Peninsula Field Training
Required annually for all personnel who will be working from the vessel on islands or sea ice.

4.10. Island Survival
A one-hour class required for all small boat operators and recommended for frequent small boat passengers.

4.11. Palmer Backyard and Glacier Travel
A 15 min video is required for personnel who visit the Backyard or the glacier behind Palmer Station.

4.12. McMurdo Outdoor Safety Lecture (OSL)
This course is required annually for all USAP participants who want to recreate from McMurdo Station on any established trail where checkout is required.

4.13. McMurdo Winter Over Safety Training (WOST)
All USAP personnel spending any amount of time in McMurdo during the winter season will complete WOST. Covers winter-specific information such as travel and communication protocol and survival bag requirements.

5. Safety Forms

5.1 The forms on the following pages may be printed out and used. Contractor-developed forms may be used in lieu of the first three forms, provided the contractor forms contain the same information, at a minimum:

- Appendix B: FORM_2000.10-2 Fire Prevention Checklist for Administrative Occupancies

- Appendix C: FORM_2000.10-3 Confined Space Entry Permit
- Appendix D: FORM_2000.10-4 Activity Hazard Analysis

5.2. The following form must be used as it is, with no substitution permitted:

- Appendix E: FORM_2000.10-5 Safety Requirement Waiver/Variance Request Form

Appendix A: List of Acronyms

AAUS: American Academy of Underwater Sciences
ABM: Activity Based Manager
AHA: Activity Hazard Analysis
AHJ: Authority Having Jurisdiction
ANSI: American National Standards Institute
ATV: All-Terrain Vehicle
BOI: Board of Investigation
CAGE: Cerebral Arterial Gas Embolism
CFR: Code of Federal Regulations
CGA: Compressed Gas Association
CO2: Carbon Dioxide
CO: Contracting Officer
COR: Contracting Officer's Representative
CPR: Cardiopulmonary Resuscitation
dBA: A-weighted decibels (an expression of the relative loudness of sounds, as perceived by the human ear)
DCS: Decompression Sickness
DHHS: Department of Health and Human Services
DOD: Department of Defense
DOT: Department of Transportation
DSO: Diving Safety Officer
FAR: Federal Acquisition Regulations
FOIA: Freedom of Information Act
FOPS: Falling Object Protective Structures
GFCI: Ground Fault Circuit Interrupter
GPS: Global Positioning System
IBC: International Building Code
ICC: International Code Council
IDLH: Imminently Dangerous to Life and Health
IFC: International Fire Code
LEL: Lower Explosive Limit
LFL: Lower Flammable Limit
NEC: National Electrical Code
NFPA: National Fire Protection Association
NIOSH: National Institute for Occupational Safety and Health
NRC: Nuclear Regulatory Commission
NSF: National Science Foundation
O&M: Operations and Maintenance
OPP: Office of Polar Programs
OSH: Occupational Safety & Health
OSHA: Occupational Safety & Health Administration
PEL: Permissible Exposure Limit
PESH: Polar Environment, Safety & Health
PFD: Personal Flotation Device

PI: Principal Investigator
PPE: Personal Protective Equipment
ppm: Parts per million
RAC: Risk Assessment Code
SAE: Society of Automotive Engineers
SDCB: Scientific Diving Control Board
SDS: Safety Data Sheet
SME: Subject Matter Expert
SOH: Safety & Occupational Health
SOHO: Safety & Occupational Health Officer
SOP: Standard Operating Procedure
STS: Standard Threshold Shift
T-Event: Technical Event (third-party organization deploying to Antarctica to repair a science project's equipment)
TLV: Threshold Limit Values
USACE: U.S. Army Corps of Engineers
USAP: United States Antarctic Program
UL: Underwriters Laboratories (an independent, not-for-profit testing laboratory)
UV: Ultraviolet (in referring to radiation)

Appendix B: FORM 2000.10-2

Fire Prevention Checklist for Administrative Occupancies

Instructions: An occupant appointed by the supervisor completes the checklist monthly for each building. Maintain in file for one year. Corrective actions should be noted on reverse side.

Section:_____ Date:_____

1. Are emergency phone numbers posted? _____

2. Are hallways and stairs free of obstructions? _____

3. Areas near heating appliances free of combustibles? _____

4. Are fire extinguishers visually inspected and operating instructions attached? _____

5. Do all electrical fixtures and appliances appear to be in a safe condition? _____

6. Are extension cords UL or CE listed? _____

7. Are extension cords overloaded? (No more than three items may be plugged into a non-circuit breaker protected extension cord.) _____

8. Are appliances located on a noncombustible base and unplugged if not in use? _____

9. Are exit lights and emergency illumination operational? _____

10. Are exits and exit doors free of obstructions and unlocked during hours of operation? _____

11. Is the building fire alarm system operational? _____

12. Are transformers unplugged if attached equipment is not in use? _____

_____
Printed name of inspecting person

_____
Signature of inspecting person

Appendix C: FORM 2000.10-3

Confined Space Entry Permit

Instructions: A confined space entry permit can be in whatever format desired, but the information listed on this form must be included, at a minimum. This permit may be used in lieu of a contractor-developed form.

Location of space _____

Description of space _____

Employee authorizing entry _____Date_____

Purpose of authorization _____

Entry authorized from (time) _____ to _____Date_____

Authorized entrants _____

_____

Authorized attendant(s) _____

_____

SPACE HAZARDS AND CONTROLS

Identification of gas meter used and calibration date: _____

Asphyxiation: oxygen deficiency ☐ chemical ☐ engulfment ☐

Flammable/explosive: dust ☐ chemical ☐ (specify)_____

Toxic: chemical ☐ (specify)_____

Unauthorized activation: mechanical _____electrical _____

The confined space shall be isolated or potential hazards controlled by:

Depressurization ☐ Purging and cleaning pipe ☐ Lockout/tagout ☐

Blanking/capping pipe ☐ Other ☐ (specify)_____

Rescue services/equipment are available: on-site ☐ outside ☐

Communication equipment/procedures to be used:

The following personal protective equipment have been assigned to, and shall be worn by, entrants:

Hot work [may]/[shall not] be conducted in this space.

If hot work is permitted, the following controls shall be utilized:

TESTING AND MONITORING

The space has an oxygen content of _____and is [safe]/[unsafe]

The space has been monitored and contains the following concentration of
toxic hazards:
carbon monoxide_____
hydrogen sulfide _____
other (specify) _____

The space has been tested and contains the following percentages of lower flammable limit of flammable/explosive chemicals (specify):

Monitoring will be conducted: continuously ☐ or at intervals ☐

AUTHORIZATION: All actions and conditions necessary for safe entry to, work in, and exit from the confined space have been performed. Entry is permitted on the date and time, and for the duration, specified above.

_____
(Signature of individual authorizing entry)

CANCELLATION: All entrants have exited the confined space and this permit is canceled.

_____ Time _____
(Signature of individual authorizing entry)

Appendix D: FORM 2000.10-4

Activity Hazard Analysis

Instructions: Contractors may develop and use their own Activity Hazard Analysis form, provided it contains the information listed below, at a minimum. Otherwise, this form may be used.

1. Contract No.	2. Project	3. Facility
4. Date	5. Location	6. Estimated Start Date
7. PRINCIPAL STEPS	8. POTENTIAL HAZARDS	9. RECOMMENDED CONTROLS
10. EQUIPMENT TO BE USED	11. INSPECTION REQUIREMENTS	12. TRAINING REQUIREMENTS
Risk assessment code (RAC) based on probability of an incident occurring and severity of loss if one occurs (Low-Med-High):		
13. Contractor (Signature & Date)		
14.If RAC medium or high, signature of NSF representative on site, or if none, appropriate NSF program manager/ABM remote: _____		15. NSF ABM: (Signature & Date)

Appendix E: FORM 2000.10-5

Safety Requirement Waiver/Variance Request Form

National Science Foundation/Office of Polar Programs

Safety Requirement Waiver/Variance Request Form

Waiver Information

PROJECT: Click here to enter text. DATE: Click here to enter a date.

SUBJECT: Click here to enter text.

1. SAFETY REQUIREMENT AND/OR CODE REQUIREMENTS TO BE WAIVED:
Click here to enter text.

2. SAFETY REQUIREMENT/STANDARD/CODE REFERENCES:
Click here to enter text.

3. DEFINE WHETHER A TEMPORARY OR PERMANENT VARIANCE IS BEING REQUESTED:

- EXPLAIN WHAT LENGTH OF TIME IS REQUIRED AND WHY;
- IS THE REQUEST A WAIVER OF REQUIRMENT, A DELAY OF IMPLEMENTATION OR A SUGGESTION OF AN ALTERNATIVE SOLUTION?

Click here to enter text.

4. RATIONALE FOR WAIVING THE SAFETY REQUIREMENT/STANDARD/ CODE

A. GIVE A COMPLETE EXPLANATION DEFINING THE NECESSITY OF THE VARIANCE:
   - AN EXPLANATION OF THE CURRENT OR PROPOSED CONDITION;
   - WHY IT DOES NOT CONFORM WITH THE RULE;
   - WHAT WOULD BE NECESSARY TO COMPLY WITH THE RULE;
   - BACKGROUND INFORMATION ABOUT THE CONDITION;
   - HOW IT HAS AFFECTED LIFE, HEALTH AND SAFETY

Click here to enter text.

B. PROVIDE DEFINITIVE INFORMATION AS TO WHY THE VARIANCE CAN BE GRANTED WITH NO ADDITIONAL OR UNDUE THREAT TO THE HEALTH AND SAFETY OF THE PUBLIC, SUCH AS:
   - OPERATIONAL HISTORY;
   - HISTORY OF SIMILAR CONDITIONS;
   - EXPERT TESTIMONY; OR,
   - AN ALTERNATIVE SOLUTION TO PROTECT THE PUBLIC.

Click here to enter text.

5. RECOMMENDED ALTERNATIVE MEANS TO ACHIEVE EQUIIVALENT PROTECTION
   - PROCESS, PROCEDURE, OR EQUIPMENT TO BE IMPLEMENTED;

Click here to enter text.

6. HAZARD ANALYSIS EVIDENCING RISK MITIGATION AND IDENTIFICATION OF RESIDUAL RISK :

- NEED TO IDENTIFY RISK IN CURRENT STATE;
- NEED TO IDENTIFY RISK AFTER IMPLEMENTATION;
- NEED TO IDENTIFY RESIDUAL RISK AFTER IMPLEMENTATION

Click here to enter text.

7. COST ESTIMATE
   - INCLUDE ALL COSTS ASSOCIATED (PLANNING,PROCUREMENT, SHIPPING, INSTALLATION, O&M, OTHER)
   - PLEASE ADD A NOTE ABOUT LIFE EXPECTANCY IF EQUIPMENT/REPAIR INCLUDED

Click here to enter text.

PEER REVIEW AND RECOMMENDATION

PEER REVIEW COMMENTS:

Click here to enter text

Click here to enter text. Click here to enter a date.

REVIEWER ELECTRONIC SIGNATURE *DATE*

RECOMMENDATION: ☐ CONCUR ☐ DO NOT CONCUR

NATIONAL SCIENCE FOUNDATION (NSF) APPROVAL

NSF COMMENTS:
Click here to enter text.

Click here to enter text. Click here to enter a date.

NSF OPP SAFETY OFFICER *DATE*

NAME: Click here to enter text. TITLE: Click here to enter text.