Idaho State University

Responder Safety & Health Annex

October 2024

Table of Contents

Record of Changes

Date Revised	Section(s)/Page(s)	Summary of Revisions	Entered by

Purpose

Idaho State University cares about the physical and mental well-being of its staff, faculty, and students and is fully committed to protecting the health and safety of the University community. The purpose of the Responder Health & Safety Annex is to focus on identifying and reducing the risk of illness and injury through appropriate surveillance, prevention, and control programs and measures. The document contains quick reference guides for common hazards during response efforts and provides strategies individuals can use to ensure they are taking care of themselves mentally, allowing for them to flourish in their roles, manage stress, and boost resilience.

Situation & Assumptions

Mental and physical health are equally important components of overall health. This becomes especially true for teams dealing with emergency situations where individuals are facing difficulty and often working in conditions that are outside of their normal day-to-day routines. Adhering to established safety protocols and incorporating strategies aimed at improving mental health helps teams remain agile when changing roles and responsibilities.

Assumptions:

- Individuals understand the safety risks, will follow protocols for personnel safety, and promptly report unsafe conditions accordingly.
- The ISU Leadership Team will have access to Subject Matter Experts as needed to educate responders and the Bengal community on the applicable health impacts.
- Appropriate levels of Personal Protective Equipment (PPE) will be on hand or available through rapid purchasing channels.
- Building resilience before a disaster can help mitigate the effects stress has on staff, faculty, and students experiencing the disaster.

Roles and Responsibilities

Role	Responsibility
Policy Group	• Providing leadership and management to ensure a safe and healthy work environment; • Require partners and affiliates to perform their work in a manner that protects the University from unnecessary safety liabilities.
Incident Leadership Team	• Provide for a Safety Officer, as requested by the on-scene responders when the EOC is not activated; • Assign a Safety Officer to the Leadership Team during EOC activation, as needed; • Provide health and safety guidance to EOCs and Incident Commanders during emergency response operations and training opportunities; and

	• Ensure all responders under the control of ISU are aware of and comply with OSHA guidelines.
Environmental Health, Safety & Sustainability Department	• Provide the primary oversight and leadership concerning health and safety issues; • Request additional safety officers as needed to meet job demands; • Conduct safety analysis and briefings during response operations; and • Make recommendations and/or provide for Personal Protective Equipment, as needed.
Department of Radiation Safety	• Serve as the subject matter expert, as requested for radiological disasters; and • Make recommendations and/or provide for Personal Protective Equipment, as needed.
Supervisors	• Ensure employees have appropriate training and adequate safety equipment; • Promptly address safety concerns and make recommendations for improving safe practices; and • Encourage employees to follow all safety rules and regulations.
First Responders	• Recognize and prioritize personal safety by following established safety protocols, and utilization of protective measures; • Read and practice the health and safety protocols found within this annex.

Concept of Operations

ISU will identify and reduce the risk of illness and injury of first responders, staff, and volunteers through appropriate prevention, surveillance, and control programs and measures by identifying limits of exposure, providing job-specific guidelines, and conducting post-event follow-up assessments. The intent is to:

- Identify exposures and/or signs and symptoms;
- Prevent or mitigate adverse physical and psychological outcomes for responders;
- Ensure workers maintain their response ability and prevent injuries during the response;
- Evaluate protective measures needed based on the incident; and
- Identify responders for medical referral and possible enrollment in long-term health surveillance as needed.

The concepts identified throughout this annex are utilized through pre-deployment, deployment, and post-deployment of responders and continual in their application.

Prevention & Mitigation

ISU mitigates the risk of illness and injury through the identification of risks, education of hazards, and access to and proper utilization of PPE.

Identification of Risk

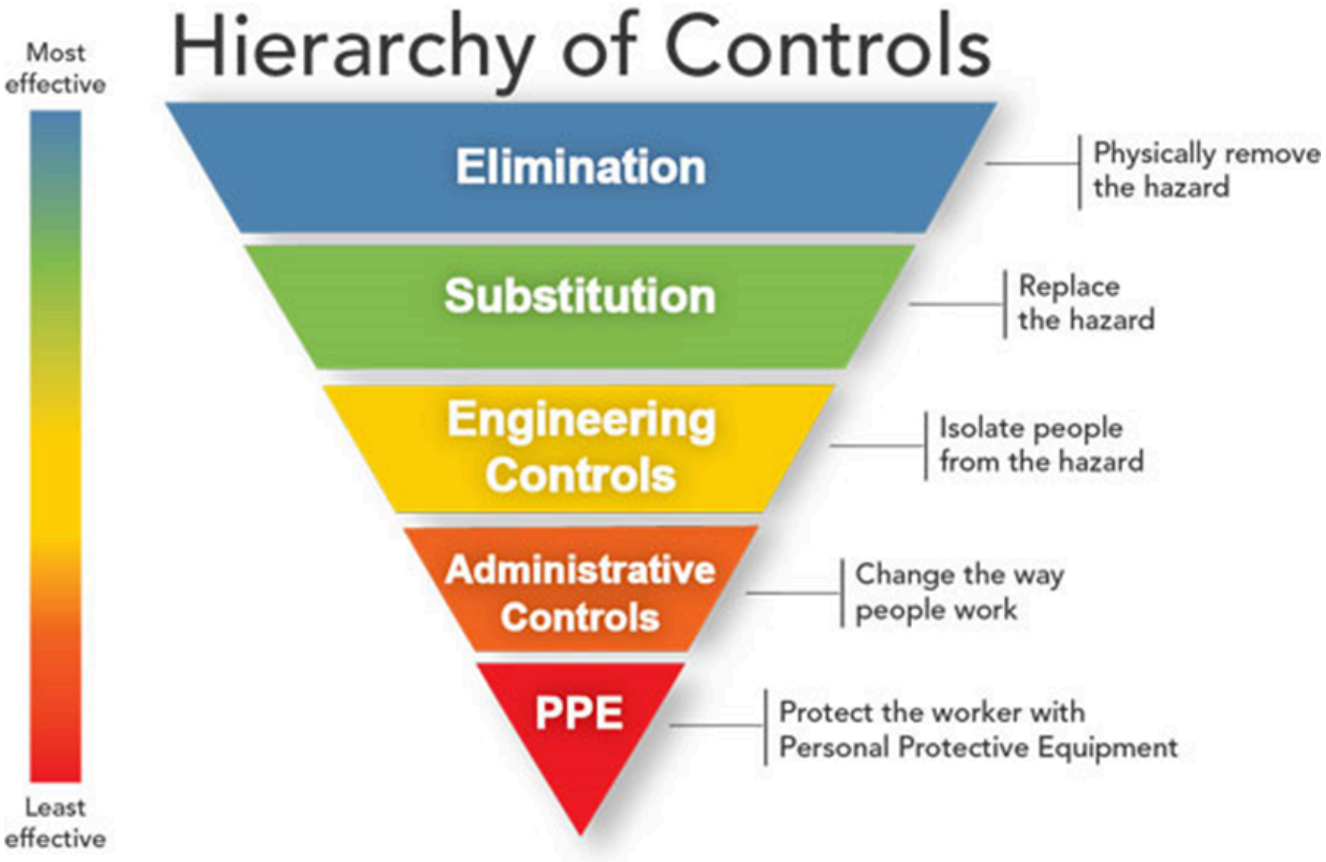
The Environmental Health Safety and Sustainability (EHSS) Executive Director or the Incident Commander has the responsibility to work with the ISU Leadership Team to identify the risk of illness or injury by understanding what factors of an incident pose hazards to worker safety and health prior to an emergency occurring.

Education

ISU participates in hazard assessments and recognizes the safety risks associated with them. EHSS is responsible for providing Occupational Safety Training to employees. Training is available upon request throughout the year, and available offerings are listed on the website at isu.edu/ehs/training-/. Some of the relevant training for employees includes bloodborne pathogens, confined space, fall protection, heat/cold stress, respiratory protection, and slips, trips, and falls.

Hierarchy of Controls

ISU utilizes a variety of controls to help improve safety on a day-to-day basis and during incident response activities as identified in the Hierarchy of Controls. The hierarchy of controls is a method of identifying and ranking safeguards to protect working from hazards. It is a product of OSHA's Recommended practices for Safety & Health Programs. They are arranged from the most to the least effective, as shown in the graph below.



Elimination makes sure the hazard no longer exists. Examples:

- Ending the use of a hazardous material
- Doing work at ground level rather than at heights
- Stopping the use of noisy processes

Substitution means changing out a material or process to reduce the hazard. Examples:

- Switching to a less hazardous material
- Switching to a process that uses less force, speed, temperature, or electrical current

Engineering controls reduce exposure by preventing hazards from coming into contact with workers. They still allow workers to do their jobs, though. Examples:

- Noise enclosures
- Local exhaust ventilation
- Guardrail system
- Machine guards
- Interlocks
- Lift equipment
- Identifying

Administrative controls change the way work is done or give workers more information by providing workers with relevant procedures, training, or warnings. They're often used together with higher-level controls. They include

- Procedures, such as equipment inspections, planned preventive maintenance, checklists, lockout/tagout/tryout, infection prevention, and control practices, changing work schedules, pre- and post-task reviews, and rotation of workers
- Training on topics such as hazard communication, permit-required confined space entry, lockout/tagout/tryout, and safe work procedures
- Warnings, such as signs, backup alarms, smoke detectors, computer messages, mirrors, horns, labels, and instructions

Personal protective equipment (PPE) includes clothing and devices to protect workers. PPE needs constant effort and attention (including proper use and training) from workers. Higher-level controls aren't always feasible, and PPE might be needed in conjunction with other control measures. Examples:

- Safety glasses
- Personal Fall Protection Systems and related equipment
- Hardhats
- Respirators
- Hearing protection
- Protective clothing

For additional information and application of OSHA's Hierarchy of Controls, visit www.osha.gov/safety-managmen

Response

It is critical that all employees be alert to safety issues and potential health hazards during day-to-day operations, but, even more so during a disaster. Employees may encounter various hazards during the response. Appendix C to this Annex provides detailed information for maintaining responder health and safety utilizing a variety of potential hazards including heat stress, cold stress, contamination, bloodborne pathogens, influenza, etc.

Surveillance

Monitoring throughout the response will be prioritized to ensure safety issues are promptly reported, responded to quickly, and reviewed so that adjustments can be implemented. Monitoring and surveillance may be conducted using FEMA's Emergency Responder Health Monitoring and Surveillance (ERHMS) Program, or other similar system. Responder health monitoring and surveillance may be coordinated with EHSS or the local Public Health District.

Personal Protective Equipment (PPE)

All responders are expected to utilize appropriate protective equipment. PPE is intended to minimize the risk of exposure and/or transmission of infectious organisms or substances and is provided to response staff at no cost. Specific equipment needed for each role will be determined at the time of the event depending on risk and is the responsibility of supervisors in a response, with assistance from a trained safety officer.

PPE available for use at ISU include:

- Gloves (sterile and non-sterile)
- Procedure masks
- Respirators (N-95)
- Safety glasses, goggles, and face shields
- Disposable gowns, caps, and booties

The EHSS staff will coordinate just-in-time training on PPE protocols for staff and volunteers at the time of an event. The training will include:

- Identification of the types of PPE available for staff and volunteers to use in the event of an emergency;
- Discussion of how to select the proper PPE based on the emergency;
- Demonstration of use and practice of PPE use, including donning and removing equipment.

Recovery

Following emergency response, employees are encouraged to utilize available resources to ensure physical and mental wellbeing (Appendix B).

Appendix A: Personal Protective Equipment

Levels of PPE

PPE serves as the necessary protection barrier between the wearer and a hazardous substance. It provides a barrier between the body and hazardous material, preventing harmful chemicals or agents from contacting the skin, eyes, and lungs. PPE also allows triage, decontamination, and management of contaminated patients. It helps prevent the further spread of contamination.

Staff that will need to wear N95 (or higher) respirators must be medically-cleared, trained, and fit-tested for respirator use. Detailed information on respiratory protection programs, including fit testing procedures, can be accessed at OSHA's Respiratory Protection eTool: (www.osha.gov/SLTC/etools/respiratory). PPE training topics should include all of the following:

- Proper fit-testing, wearing and use of respirators;
- Safe removal of respirators;
- Safe disposal of disposable respirators or cleaning and disinfection of reusable respirators;
- Medical contraindications to respirator use.

As required by CFR 29 1910.120 App. B, Personal Protective Equipment (PPE) selected for use, will protect employees from the specific hazards that they are likely to encounter during their on-site work.

Key factors involved in the selection of appropriate PPE:

- Identification of the hazards, or suspected hazards;
- Routes of potential hazard to employees (inhalation, skin absorption, ingestion, and eye or skin contact);
- Performance of the PPE materials (and seams) in providing a barrier to these hazards.

The amount of protection provided by PPE is material-hazard specific. In instances when PPE cannot provide continuous protection for the protective material, it should exceed the work duration. PPE selection should match worker role requirements with task-specific conditions. The durability of PPE materials, such as tear strength, seam strength, heat stress, and task duration should be considered in relation to the employee's tasks. In some cases, layers of PPE may be necessary to provide sufficient protection or to protect expensive PPE inner garments, suits, or equipment.

Sources to Identify Appropriate PPE

- Industrial Chemical Hazard: http://www.cdc.gov/niosh/npg/npgsyn-c.html
- Radiological Hazard: https://remm.hhs.gov/radiation_ppe.htm
- Biological Hazard: http://www.cdc.gov/niosh/docs/2009-132/
- Terrorism Event:http://www.cdc.gov/niosh/docs/2008-132/pdfs/2008-132.pdf
- Weaponized Chemicals and Biotoxins: http://www.cdc.gov/NIOSH/ershdb/AgentListCategory.html

Safety Issues

There are several safety issues to consider when wearing PPE. These may include:

- Potential for heat stress illnesses – While the fabric is designed to keep the hazardous agents out, it also keeps the generated metabolic heat in. This coupled with a warm working environment temperature may produce excessive heat stress – this is a serious concern for all.
- Dexterity and mobility issues – PPE may reduce the dexterity and mobility of the healthcare worker.
- Reduced Vision – Vision may be reduced by light reflecting off the respirator face-piece or internal fogging. Vision may be restricted by the size and shape of the clear protective lenses.
- Lack of air supply – If the ensemble uses a Self-Contained Breathing Apparatus (SCBA), the air supply and, therefore, the working time will be limited by the size of the air bottle.
- Trip hazards – Because of restricted vision and the cumbersome addition of over boots personnel may be prone to tripping. Not only must personnel worry about tripping from the Personal Protective Equipment, but they must also be concerned about the work location and watch out for trip hazards in the area.
- Communication problems – The ability to be understood from inside a protective mask and the ability to hear may be a problem when wearing a respirator such as a Power Air Purifying Respirator. The noise from the motor-driven fan coupled with the air blowing into the worker's breathing zone is an example.
- Fatigue – Responders may experience the rapid onset of fatigue and some may experience a little claustrophobia from time to time.

The more that is known about the site, the easier it becomes for supervisors to choose the correct PPE protection. Key factors when selecting PPE include:

- Identification of the hazard, or suspected hazard, and understanding what materials perform the best
- Routes of exposure (inhalation, skin absorption, ingestion, and eye or skin contact) matching the PPE to the employee's work requirements and task-specific conditions.
- The durability of PPE materials, such as tear strength and seam strength, should be considered in relation to the employee's tasks.
- The effects of PPE in relation to heat stress and task duration are a factor in selecting and using PPE.
- In some cases, layers of PPE may be necessary to provide sufficient protection or to protect PPE inner garments, suits, or equipment.

Training Needs

All PPE should be used in accordance with OSHA regulations found at 29 CFR 1910 Subpart I: Personal Protective Equipment. Workers must receive training on and demonstrate an understanding of when to use PPE; what PPE is necessary; how to properly put on, use, take off, properly dispose of, and maintain PPE; and the limitations of PPE.

Appendix B: Tips for Self Care

Responding to disasters can be stressful and challenging at times. Stress prevention and management is essential for responders to stay well and continue to help in the situation. The following steps responders can take before, during and after an event.

Before

- Try to learn as much as possible about your role in a response.
- If you will be traveling or working long hours during a response, explain this to loved ones who may try to contact you. Come up with ways you may be able to communicate with them. Keep their expectations realistic, and take the pressure off yourself.
- Talk to your supervisor and establish a plan for who will fill any urgent ongoing work duties unrelated to the disaster while you are engaged in the response.

During

Limit your time working alone by trying to work in teams. Responders experience stress during a crisis. When stress builds up it can cause burnout and secondary traumatic stress. Coping techniques like taking breaks, eating healthy foods, exercising, and using the buddy system can help prevent and reduce burnout and secondary traumatic stress. Recognize the signs of both of these conditions in yourself and other responders to be sure those who need a break or need help can address these needs.

<u>Signs of Burnout:</u>

Feelings of extreme exhaustion and being overwhelmed.

- Sadness, depression, or apathy
- Easily frustrated
- Blaming of others, irritability
- Lacking feelings, indifferent
- Isolation or disconnection from others
- Poor self-care (hygiene)
- Tired, exhausted, or overwhelmed
- Feeling like:
    - A failure
    - Nothing you can do will help
    - You are not doing your job well
    - You need alcohol/other drugs to cope

<u>Signs of secondary traumatic stress:</u>

Stress reactions and symptoms resulting from exposure to another individual's traumatic experiences, rather than from exposure directly to a traumatic event.

- Excessively worry or fear about something bad happening
- Easily startled, or "on guard" all of the time
- Physical signs of stress (e.g. racing heart)
- Nightmares or recurrent thoughts about the traumatic situation
- The feeling that others' trauma is yours

Get support from team members: Develop a Buddy System

- In a buddy system, two responders partner together to support each other and monitor each other's stress, workload, and safety.
- Get to know each other. Talk about background, interests, hobbies, and family. Identify each other's strengths and weaknesses.
- Keep an eye on each other. Try to work in the same location if you can.
- Set up times to check-in with each other. Listen carefully and share experiences and feelings. Acknowledge tough situations and recognize accomplishments, even small ones.
- Offer to help with basic needs such as sharing supplies and transportation.
- Monitor each other's workloads. Encourage each other to take breaks. Share opportunities for stress relief (rest, routine sleep, exercise, and deep breathing).
- Communicate your buddy's basic needs and limits to leadership – make your buddy feel "safe" to speak up.

Responder Self-Care Techniques

- Limit working hours to no longer than 12-hour shifts.
- Work in teams and limit the amount of time working alone.
- Write in a journal.
- Talk to family, friends, supervisors, and teammates about your feelings and experiences.
- Practice breathing and relaxation techniques.
- Maintain a healthy diet and get adequate sleep and exercise.
- Know that it is okay to draw boundaries and say "no."
- Avoid or limit caffeine and use of alcohol.

It is important to remind yourself:

- It is not selfish to take breaks.
- The needs of survivors are not more important than your own needs and well-being.
- Working all of the time does not mean you will make your best contribution.
- There are other people who can help in the response.

After

Idaho State University's Counseling and Mental Health Center is a good resource for helping to maintain a healthy wellbeing following an emergency situation. Adjusting to life at home may come with challenges and additional stressors, specifically in instances where emergency response lasted a long time or was traumatic because of the response needs. This resource was developed to help families at the conclusion of a disaster response: https://responderstrong.org/wp-content/uploads/2020/04/SAMHSA-Family-Tips-post-Disaster.pdf.

Appendix C: Specific Hazard Guidance

Bloodborne Pathogens

By rigorously following the requirements of Occupational Safety and Health Administration's blood-borne Pathogens Standard in the following five areas, it is possible to eliminate or minimize employees occupational exposure to blood-borne pathogens as much as possible.

Universal Precautions: The practice of "Universal Precautions" is to prevent contact with blood and other potentially infectious materials. Treat all human blood and the following body fluids as if they are known to be infectious for HBV, HCV, HIV, and other blood-borne pathogens:

- Semen
- Vaginal Secretions
- Amniotic Fluid
- Saliva
- Breast Milk

In circumstances where it is difficult or impossible to differentiate between body fluid types, assume all body fluids to be potentially infectious.

Engineering Controls: The following engineering controls are used throughout the facility:

- Hand washing facilities (or antiseptic hand cleansers and towels or antiseptic towelettes), which are readily accessible to all employees who have the potential for exposure.
- Containers for contaminated reusable-sharps having the following characteristics:
    - Puncture-resistant;
    - Color-coded or labeled with a biohazard warning label;
    - and Leak-proof on the sides and bottom.
- Specimen containers which are:
    - Leak-proof;
    - Color-coded or labeled with a Biohazardous warning label; and
    - Puncture-resistant, when necessary.
- Secondary containers which are:
    - Leak-proof;
    - Color-coded or labeled with a biohazard warning label; and
    - Puncture-resistant, if necessary.

Work Practice Control: The following Work Practice Controls are recommended as part of the bloodborne pathogens compliance:

- Employees use Occupational Safety and Health Administration-approved "safety needles" for injections, blood draws, and specimen collection.
- Employees wash their hands immediately, or as soon as feasible, after removal of gloves or other personal protective equipment.

- Following any contact of body areas with blood or any other infectious materials, employees wash their hands and any other exposed skin with soap and water as soon as possible. They also flush exposed mucous membranes with water.
- Contaminated needles and other contaminated sharps are not bent, recapped, or removed.
- Based on this "cross-checking" the new job classifications and/or tasks and procedures that will bring the employee into occupational exposure situations are identified.
- The employee is trained by the appropriate personnel regarding any work practice controls that the employee is not experienced with.

Personal Protective Equipment: Personal Protective Equipment is our employees' "last line of defense" against bloodborne pathogens. Because of this, our facility provides (at no cost to our employees) the Personal Protective Equipment that they need to protect themselves against such exposure. This equipment includes, but is not limited to:

- Gloves
- Laboratory coats
- Face shields/masks
- Mouthpieces
- Pocket masks

Hypoallergenic gloves are readily available to employees who are allergic to the gloves our facility normally uses.

Employees are trained regarding the use of the appropriate personal protective equipment for their job classifications and the tasks/procedures they perform. Additional training is provided, when necessary, if an employee takes a new position or new job functions are added to their current position.

To ensure that personal protective equipment is not contaminated and is in the appropriate condition to protect employees from potential exposure, our facility adheres to the following practices:

- All personal protective equipment is inspected periodically and repaired or replaced as needed to maintain its effectiveness.
- Reusable personal protective equipment is cleaned, laundered, and decontaminated as needed.
- Single-use personal protective equipment (for equipment that cannot, for whatever reason, be decontaminated) is disposed of by placing equipment in bio-hazardous containers.

To assure that this equipment is used as effectively as possible, employees must adhere to the following practices when using personal protective equipment:

- Any garments penetrated by blood or other infectious materials are removed immediately, or as soon as feasible.
- All personal protective equipment is removed prior to leaving a work area.
- Gloves are worn in the following circumstances:
    - Whenever employees anticipate hand contact with potentially infectious materials.
    - When performing vascular access procedures.
    - When handling or touching contaminated items or surfaces.
- Disposable gloves are replaced as soon as practical after contamination or if they are torn, punctured, or otherwise lose their ability to function as an "exposure barrier".
- Masks are used whenever splashes or sprays may generate droplets of infectious materials.
- Protective clothing (such as lab coats) is worn whenever potential exposure to the body is anticipated.

Housekeeping: The following outlines safe practices for maintaining a facility in a clean and sanitary condition:

- The area should be cleaned or decontaminated using cleansers and disinfectants.
- Consistent time of day with special consideration for schedule changes

Cold Stress- Cold-Related Illnesses

Increased risk factors in a cold environment include:

- Alcohol
- Lean body mass
- Psychotropic medication
- Physical exhaustion

Workload in Cold Environments

In cold environments, the principal routes of fluid loss and subsequent deficit are cold-induced diuresis, respiratory water loss, cold weather clothing, and the metabolic cost of movement and reduced fluid intake. Personnel are to be encouraged to eat a normal diet, incorporating moderate carbohydrate and fat intake.

Wind Chill Temperature Index Reference Values and Advisory Flag Colors

WIND SPEED	TEMPERATURE (F)								
CALM	40	35	30	25	20	15	10	5	0
MPH	EQUIVALENT CHILL TEMPERATURE								
5	35	30	25	20	15	10	5	0	-5
10	30	20	15	10	5	0	-10	-15	-20
15	25	15	10	0	-5	-10	-20	-25	-30
20	20	10	5	0	-10	-15	-25	-30	-35
25	15	10	0	-5	-15	-20	-20	-35	-45
30	10	5	0	-10	-20	-25	-25	-40	-50
35	10	5	-5	-10	-20	-30	-30	-40	-50
40	10	0	-5	-15	-20	-30	-30	-45	-55
	CAUTION					DANGER			

Working Practice Guidance in Cold Environment

Wind Chill Condition	Required Precautions and Hourly Work/Warming Cycle
Standard	**Wear gloves, do not perform work for more than 10 minutes, and cover metal handles and bars with thermal insulation.**
Moderate	**Follow Standard precautions, no outdoor operations with water, wear gloves and total body protection, avoid heavy sweating, change wet clothes immediately, and implement the 'buddy' system.** **50 MINUTES WORK/20 MINUTES WARMING**
Caution	**Follow both Standard and Moderate precautions, and wear mittens, not gloves.** **40 MINUTES WORK/20 MINUTES WARMING**
Danger	**Follow Standard through Caution actions.** **30 MINUTES WORK/30 MINUTES WARMING**
Extreme	**MISSION-CRITICAL WORK ONLY**

Cold Environment Considerations: Cold impinges on safety by a variety of mechanisms comprising:

- Exposure of arms and hands with subsequent reduction in sensation and manual dexterity.
- Discomfort and subsequent distraction.
- Limitation of movement and duties while wearing bulky protective clothing.
- Contact with freezing metal components.
- Dehydration.
- Sleep deprivation is associated with higher sensations of cold and shivering.

Cold Exposure Reduction: The following may reduce cold exposure:

- Elimination of non-essential outdoor tasks.
- Where possible, performing tasks indoors.
- Provision of temporary shelter for essential outdoors work, preferably heated.
- Increasing the number of personnel allocated to a task and operating a rotational duty system.
- Layered protective clothing systems.

Cold Injury

If body heat loss exceeds heat production, hypothermia will develop. The condition is defined as occurring when the body's core temperature falls to 95° F or below. Recognizing the early signs and symptoms of hypothermia is the key to treatment and management. These include:

1. Profound shivering.
2. Slurred speech.
3. Psychological symptoms including aggressive or withdrawn behavior.
4. Progressive reduction in the shivering response and loss of consciousness.

Hypothermia

Hypothermia is defined as a core temperature below 95°F and develops as the rate of heat loss exceeds heat production. Three types of hypothermia can be distinguished, based upon the mechanism of cold exposure comprising:

1. Immersion: Very severe cold stress occurs, for example, following ejection into water.
2. Exhaustion: Less severe cold stress, most frequently following a combination of wind and wet exposure with moderately low temperatures.
3. Urban: Cold is relatively mild and prolonged. Most common in the elderly or malnourished.
4. Diagnosis of Hypothermia: In a cold environment, the possibility of hypothermia should always be suspected. Early symptoms comprise changes in behavior followed by uncoordinated movement, staggering, dysarthria, and subsequent clouding and loss of consciousness with an eventual fall in heart and respiratory rate, with death as the final outcome.

Freezing and Non-Freezing Cold Injury

As skin temperature approaches 30°F, the potential for freezing of tissues and subsequent frostbite increases. Moreover, prolonged contact with water or wet clothing in the temperature range of 53°F can result in swelling, numbness, and blanching, followed some time later by intense pain and hypothermia in the affected body area.

Frostbite

Frostbite is a localized lesion caused by freezing, usually affecting the feet, hands, ears, nose, and cheeks. In frostbite, the tissues are hard, insensitive, and white or mottled.

Frostnip

In frostnip, painful exposed skin blanches and loses sensation but remains pliable.

Contamination

Contamination is the presence of extraneous, especially infectious, material that renders a substance or preparation impure or harmful. Contamination is the presence of extraneous material that is or may be harmful to the victim/patient and the staff. There are four categories of contamination identified as follows:

1. Primary contamination – Contamination that occurs from the original source of the hazardous material release.

2. Secondary contamination – Contamination that occurs from an exposure to someone or something that has experienced primary contamination.
3. External contamination – Contamination of external surfaces, including the skin/hair, mucous membranes, clothes, personal items, equipment, etc.
4. Internal contamination – Contamination that has entered the body via absorption, injection, inhalation, or ingestion.

The forms of contamination include the three physical states of matter: gas, liquid, and solid. Gases and vapors can present both in the respiratory tract and on the skin, and they can finely divide solids such as pesticides. Liquids present either a respiratory or skin hazard depending upon their respective volatility or vapor pressure.

The routes of exposure into the body include ingestion, injection, inhalation, and absorption.

Environmental Exposures

Humans are not the only ones affected by disasters. Employees should be aware of their surroundings at all times and are particularly encouraged to watch for the following:

- Mosquitoes: Employees are encouraged to use mosquito repellent as directed when working in areas where mosquitoes are present. Anti-itch or sting ease aids may provide some relief of symptoms if bites occur. Light colored and long sleeves/pants will also provide some protection against bites.
- Snakes: Avoid them. Remember, snakes can be displaced from their usual surroundings and they may be in unexpected places. If bitten, seek medical attention immediately.
- Animals: Pets are often friendly to strangers, but, in a disaster setting they may be fearful or hurt. Precautions should be taken around unfamiliar domesticated animals. Call local animal control if you see an injured or stray animal. Wildlife should be avoided since certain animals carry disease.
- Plants: Poison ivy and poison oak are plants that are known to cause a rash when people who are sensitive to them come into contact with the plant. Some people are so sensitive to the plant that when exposed, they require medical treatment to control the symptoms. When responding to a disaster, precautions should be taken to reduce direct exposure to plants by wearing long sleeves, long pants, gloves, and /or a protective skin barrier. These measures may also protect against tick bites.

Flooding

Health Responder Roles

ISU will have a supporting role in flood response. As such, personnel will be removed from direct exposure to the majority of risks associated with the response. Predefined responder roles include:

- Coordinate with hospitals, long term care facilities, and other community partners to maintain situational awareness and a common operating picture.
- Identify Alternate Care Sites.
- Contact and support medically fragile and functional needs populations.
- Provide Agency Representatives to active incident management locations.
- Support health care activities.
- Participate in Long Term Recovery Operations.

- Practice administrative preparedness.

Risks/ Safety and Protective Measures

During a Flood

More people lose their LIVES in floods than in any other weather-related event. 80% of flood deaths occur in vehicles, and most happen when drivers make a single, fatal mistake - trying to navigate through flood waters.

Watch for the following signs:

- Unusually hard rain over several hours
- Steady substantial rain over several days
- Rains in conjunction with a spring thaw
- A monsoon or other tropical system affecting your area
- A Weather report
- Water rising rapidly in streams and rivers

In hilly terrain, flash floods can strike with little or no advance warning. Distant rain may be channeled into gullies and ravines, turning a quiet stream into a rampaging torrent in minutes. Never camp on low ground next to streams since a flash flood can catch you while you're asleep.

DO NOT DRIVE THROUGH FLOODED AREAS! Even if it looks shallow enough to cross. The large majority of deaths due to flash flooding occur with people driving through flooded areas. Water only a foot deep can displace a 1500 lb. vehicle! 24” of water can easily carry most automobiles! Roads concealed by water may not be intact.

If the vehicle stalls, leave it immediately and seek higher ground. Rapidly rising water may engulf the vehicle and its occupants and sweep them away. Remember it's better to be wet than dead!

Do not allow children to play around streams, drainage ditches or viaducts, storm drains, or other flooded areas!

Be especially cautious at night. It's harder to recognize water danger then.

Don't try to outrace a flood on foot. If you see or hear it coming, move to higher ground immediately.

Be familiar with the land features where you live, work, and play. It may be in a low area , near a drainage ditch or small stream, or below a dam. Be prepared!

Stay tuned to NOAA Weather Radio for the latest statements, watches and warnings concerning heavy rain and flash flooding in your area, report it to the National Weather Service.

The National Weather Service will issue a Flash Flood Watch when heavy rains may result in flash flooding in a specific area. In this case you should be alert and prepare for the possibility of a flood emergency which will require immediate action. A Flash Flood Warning will be issued when flash flooding is occurring or is imminent in a specified area. If your locale is placed under a warning, you should move to safe ground immediately.

After a Flood

The danger of a flood does not end when the rains cease. Cleanup crews must work together and look out for one another to ensure safety.

For most work in flooded areas, workers will need hard hats, goggles, heavy work gloves, and watertight boots with steel toe and insole (not just steel shank).

Exposure to flood waters does not increase the risk of tetanus, and tetanus immunization campaigns are not needed. While documentation of vaccination is preferred, it should not be a prerequisite for work. During flood cleanup, the risk of wounds may be increased. For this reason, cleanup workers should be sure that they are up-to-date with tetanus vaccination, ideally before starting cleanup activities. Adults need a tetanus booster shot every 10 years. Td or Tdap can be used; getting the Tdap instead of Td for one tetanus booster during adulthood is recommended to maintain protection against pertussis. Being up-to-date for tetanus vaccines can greatly simplify the treatment for any wound that might occur.

First aid, even for minor cuts and burns, is very important during flood cleanup. Immediately clean all wounds and cuts with soap and clean water. Talk to a doctor or other health professional on the scene to find out if you need more treatment.

Excessive noise from equipment such as chain saws, backhoes, tractors, pavement breakers, blowers, and dryers may cause ringing in the ears and subsequent hearing damage. If you must shout over noise to be heard, you should wear earplugs or other hearing protection devices.

Heat Stress

There is wide variation in human tolerance to heat stress. The following personal factors must be considered when assessing individual heat injury risk:

- Obesity;
- Lack of physical fitness and/or lack of sleep;
- Recent alcohol intake;
- Concurrent mild illness (e.g., diarrhea, viral illness, fever);
- Dehydration; and
- Medication or illegal drugs.

Fluid Replacement

Water is the key component of sweat that enables heat loss to occur. Therefore, it is essential to maintain fluid intake to meet losses secondary to evaporation and maintain hydration.

Thirst is an unreliable guide to the level of hydration in either a hot or cold environment. Personnel are to drink adequate water before, during and after high thermal risk activities. Urine color is a reliable indicator of an individual's hydration status. Personnel exposed to either extreme hot or cold environments are to be instructed to drink sufficient water that their urine remains colorless. The risks of over hydration and potential electrolyte imbalance are to be emphasized to all personnel.

Workload and Fluid Intake in Hot Environments

Temperature Range	Easy Work		Moderate Work		Hard Work	
	Work Rest Cycle	Water Intake Qt/Hr	Work Rest Cycle	Water Intake Qt/Hr	Work Rest Cycle	Water Intake Qt/Hr
78 – 81.9°F	No Limit	0.5	50/10 min	0.75	30/30 min	0.75
82 – 84.9°F	No Limit	0.5	40/20 min	0.75	30/30 min	1.0
85 – 87.9°F	No Limit	0.75	30/30 min	0.75	20/40 min	1.0
88 – 89.9°F	50/10 min	0.75	20/40 min	0.75	10/50 min	1.0
>90°F	40/20 min	1.0	10/50 min	1.0	Not allowed	Not applicable

Precautionary Measures during Exercise in the Heat

The following general precautionary measures are to be applied when exercising in heat:

1. Clothing should be lightweight, loose fitting and preferably natural fiber. Dress and equipment increase the risk of heat illness by increasing workload and by reducing the body area available for the evaporation of sweat. In hot environments, loose fitting clothing is to be worn, particularly at the neck and wrists to allow air circulation. Furthermore, appropriate headgear is to be worn, in addition to the use of sunblock to prevent sunburn.
2. Small quantities of fluid should be drunk at frequent intervals and water sprayed on the skin at every opportunity.
3. The use of sweat inhibiting deodorants should be avoided.

<u>First Aid and Emergency Treatment Guidance for Heat Injury</u>

Heat Illness

Recognition of heat illness is the key principle in treatment and management. In general, any individual experiencing the following signs and symptoms during physical activity in a hot environment or while wearing protective clothing should be presumed to be suffering from heat illness:

- Dizziness or confusion
- Nausea or vomiting
- Staggering
- Disturbed vision
- Collapse or loss of consciousness

Heatstroke

Heatstroke develops when the body is unable to dissipate excess heat under various combinations of high environmental temperature, high humidity, lack of wind, vigorous activity, heat retaining clothing, and dehydration. Early symptoms include excessive sweating, headache, nausea, dizziness, hyperventilation, and disturbance of consciousness. Consciousness may be lost or clouded and there may be hallucinations. There may be muscle twitching or convulsions and loss of control of the body sphincters. In severe cases there may be deep coma with pinpoint pupils and shock with tachycardia. Tachypnea is often present and breathing may become difficult and vomit subsequently inhaled. The patient feels warm or hot and has a high core temperature usually in excess of 103° F. Sweating may or may not be present.

Treatment of Heatstroke

Treatment should be started as early as possible. On suspicion of heat stroke the following guidelines may be applied:

1. Lay the patient flat and raise the legs.
2. Cool by removing clothing. Spraying with warm or tepid water, and fanning with warm air.
3. Re-hydrate with sodium rich fluid.

Heat Exhaustion

Heat exhaustion is caused by excessive exposure to heat and the depletion of body fluids. Victims sweat profusely and may shiver and have goosebumps. Weakness, nausea, dizziness, headache, poor judgment, rapid pulse, and a normal or slightly elevated body temperature are present.

Treatment of Heat Exhaustion

Treatment includes:

1. Rest in a cool, shaded environment.
2. Fluid replacement.

Sunburn

Unprotected exposure to the sun can cause sunburn. Altitude and reflective surfaces such as fresh ice, snow, sand, metal, concrete, and wind increase the risk and severity of sunburn.

Sunburn Treatment Guidelines

Mild Sunburn	Severe Sunburn (blistering)
● Avoid further exposure ● Cool soak-tap water ● Emollients ● Aspirin and other non-steroidal anti-inflammatory drugs ● Topical steroids	● As for mild sunburn plus: ● Prednisolone oral 60mg/day, tapering in one week ● Protect bullae if intact ● Admit to hospital

Influenza

Influenza (also known as the flu) is a contagious respiratory illness caused by flu viruses. It can cause mild to severe illness, and at times can lead to death. The flu is different from a cold. The flu usually comes on suddenly. People who have the flu often feel some or all of these symptoms:

- Fever* or feeling feverish/chills
- Cough
- Sore throat
- Runny or stuffy nose
- Muscle or body aches
- Headaches
- Fatigue (tiredness)
- Some people may have vomiting and diarrhea, though this is more common in children than adults.

** It's important to note that not everyone with the flu will have a fever.*

Flu Complications

Most people who get influenza will recover in a few days to less than two weeks, but some people will develop complications (such as pneumonia) as a result of the flu, some of which can be life-threatening and result in death.

Pneumonia, bronchitis, sinus and ear infections are examples of complications from flu. The flu can make chronic health problems worse. For example, people with asthma may experience asthma attacks while they have the flu, and people with chronic congestive heart failure may experience worsening of this condition that is triggered by the flu.

People at High Risk from Flu

Anyone can get the flu (even healthy people), and serious problems related to the flu can happen at any age, but some people are at high risk of developing serious flu-related complications if they get sick. This includes people 65 years and older, people of any age with certain chronic medical conditions (such as asthma, diabetes, or heart disease), pregnant women, and young children.

Flu Severity

Flu is unpredictable and how severe it is can vary widely from one season to the next depending on many things, including:

- what flu viruses are spreading,
- how much flu vaccine is available,
- when vaccine is available,
- how many people get vaccinated, and
- how well the flu vaccine is matched to flu viruses that are causing illness.

Safety and Protective Measures

To reduce their risk of pandemic influenza virus infection, poultry workers and responders should do **all** of the following:

- Immunize with the most current available Influenza Vaccination.
- Avoid unprotected direct physical contact with sick birds, poultry carcasses, and poultry feces or litter.
- Wear recommended personal protective equipment (PPE) when in direct contact with birds, poultry carcasses, and poultry feces or litter, and when going into any buildings with sick or dead poultry, or carcasses, feces, or litter from potentially-infected poultry.
- Put on and take off PPE in separate clean areas;
- Recommended PPE includes: properly-fitted safety goggles, disposable gloves, boots, a NIOSH-certified respirator (e.g., N95), and disposable fluid-resistant[1] coveralls.
- NIOSH-approved N95 (or higher) respirators are recommended for workers who have contact with HPAI H5 virus-infected birds, carcasses or potentially infected materials. Respirator use should be in the context of a comprehensive respiratory protection program in accordance with the Occupational Safety and Health Administration (OSHA) Respiratory Protection standard (29 CFR 1910.134) and other requirements. Staff that will need to wear N95 (or higher) respirators must be medically-cleared, trained, and fit-tested for respirator use. Detailed information on respiratory protection programs, including fit testing procedures, can be accessed at OSHA's Respiratory Protection eTool: (www.osha.gov/SLTC/etools/respiratory). PPE training topics should include all of the following:
    - Proper fit-testing, wearing and use of respirators;
    - Safe removal of respirators;
    - Safe disposal of disposable respirators or cleaning and disinfection of reusable respirators;
    - Medical contraindications to respirator use.
- Reusable PPE (e.g. rubber boots, rubber apron) should be:
    - Cleaned until visible dirt is removed, and then
    - Disinfected with an EPA approved disinfectant that has label claims against influenza A viruses (http://www.epa.gov/oppad001/influenza-disinfectants.html) according to the manufacturer's instructions.

Radiological hazards

Only trained response personnel will participate in the assessment of radiological conditions and provide initial assistance in the resolution of radiological hazards. The Department of Radiation Safety will provide appropriate personal protective equipment, supplies, and equipment needed for a safe response.

Respiratory hazards

This may include exposure to infected persons (biological) or environmental hazards. Unless a respirator (mask) is worn appropriately and used for the correct sized/type particulate it will not provide proper protection. The department provides respirators with 95 percent filter protection against particulates. Each employee who may be affected by respiratory hazards should be fit tested for the appropriate size.

Sanitation and infection prevention

Steps should be taken to reduce the risk of contamination or infection which include:

- Wash your hands frequently with soap and water.
- Use hand sanitizers often if soap and water are not available.
- Exercise good housekeeping measures.
- Only drink from proven potable water sources.
- Ensure proper food temperatures are maintained.
- Do not eat or drink food or water that may be contaminated.
- Cover your cough.

Slips, trips, or falls

Each MNS has an appointed Safety Officer to address overall shelter safety, but, each staff member has a duty to maintain as safe an environment as possible. Slips, trips, or falls can be avoided with appropriate preventive actions:

- Maintain clear walkways.
- Remove debris.
- Clean all spills immediately.
- Avoid running cords or cables across walkways. When unable to do so, cover cables or cords to eliminate the hazard.
- Ensure adequate lighting in the area.
- Remove trip hazards.
- Get sufficient help if assisting a mobility challenged shelteree with ambulation.
- Use good body mechanics when moving supplies and/or setting up cots.

Strains or Sprains

Working in an uncommon environment with more or different physical requirements than usual day to day work may place an employee at risk for a strain or sprain. Other potential factors for a strain or sprain could be attributed to:

- Poor physical condition.
- Muscle fatigue.
- Awkward posture.
- Repetitive motion.

To prevent strains/sprains, employees are encouraged to:

- Stay in good physical condition.
- Warm up with gentle stretching before physical activity.
- Use good body mechanics when bending or lifting.

- Ask for assistance when lifting large or heavy objects.
- Maintain adequate aisle space and clear walkways to avoid tripping.
- Have sufficient help if assisting mobility challenged shelterees.
- Take frequent rest breaks when performing repetitive motions.

Stress

The department has provided Psychological First Aid training to many staff members so they can help identify those who just need to talk from those who may need a behavioral/mental health referral. Staff members working in shelters should maintain good communication among the team about any concerns they have about shelterees or their caregivers. Some people like to work in a disaster setting and they thrive in that environment while others do not do well in high stress situations. Staff is reminded to take care of themselves and to watch for signs of stress in team members. Staff should recognize that stress can affect a person physically, cognitively, emotionally, and behaviorally. Stress should not be ignored. Suggested ways of dealing with stress include:

- Talk to someone supportive.
- Use relaxation techniques (deep breathing, meditation, or write in a journal, etc.).
- Get rest when possible.
- Accept what you cannot change.

Travel Hazards

Whether traveling alone or as a team, safety should always be a priority. Seat belts are required and are the single most effective safety device for preventing injury and death. Drivers should drive defensively. Drivers should not text, check emails, or talk on the cell phone.

If road conditions are not safe for travel, take appropriate actions including alerting the appropriate point of contact to unsafe conditions. Unsafe conditions would include but are not limited to:

- Downed power lines (treat all as if they are live).
- Downed trees.
- Water across the road.
- Workers clearing debris or construction zones.
- Snow or ice.

Violence

During times of crisis, increased stress may cause those with poor coping skills or cognitive disorders to act out. People may feel overwhelmed and exhibit inappropriate or violent behavior. There is no one action to prevent violence, so employees should be on alert to factors that could lead to violence and intervene as appropriate.

- Employees should:
- Work in teams when possible.
- Try to diffuse an escalating situation.

- Do not argue with an upset individual.
- Call for security or law enforcement, if needed.
- Leave the situation (area) if possible.
- Maintain access to exits.

Once the deployment is over, employees should try to return to their routines as soon as possible. Good nutrition, exercise, and avoiding excessive use of medication or alcohol are encouraged. If an employee is concerned that he/she needs assistance after a deployment, they should contact their supervisor.

Wildfire

Health Responder Roles

ISU will have a supporting role in wildfire response. As such, personnel will be removed from direct exposure to the majority of risks associated with the response. Predefined responder roles include:

- Mitigate and respond to wildfire smoke.
- As needed, activate the Medical Reserve Corps
- Maintain situational awareness of fire and smoke hazards.
- Provide Agency Representatives to active incident management locations.
- Coordinate with community partners to identify and assist special populations.
- Support health care activities.
- Participate in Long Term Recovery Operations.
- Practice administrative preparedness.

Risks

Wildfire Smoke Wildfire smoke can harm in multiple ways. Smoke can hurt the eyes, irritate the respiratory system, and worsen chronic heart and lung diseases.

Wildfire smoke is a mix of gasses and fine particles from burning vegetation, building materials, and other materials. Wildfire smoke can make anyone sick. Even someone who is healthy can get sick if there is enough smoke in the air. Breathing in smoke can have immediate health effects, including:

- Coughing
- Trouble breathing normally
- Stinging eyes
- A scratchy throat
- Runny nose
- Irritated sinuses
- Wheezing and shortness of breath
- Chest pain
- Headaches
- An asthma attack
- Tiredness
- Fast heartbeat

Older adults, pregnant women, children, and people with preexisting respiratory and heart conditions may be more likely to get sick if they breathe in wildfire smoke.

Safety and Protective Measures

If possible, limit exposure to smoke.

1. **Pay attention to local air quality reports**. When a wildfire occurs in your area, watch for news or health warnings about smoke. Pay attention to public health messages and take extra safety measures such as avoiding spending time outdoors.
2. **Pay attention to visibility guides if they are available**. Although not every community measures the amount of particles in the air, some communities in the western United States have guidelines to help people estimate air quality based on how far they can see.
3. **If you are told to stay indoors, stay indoors and keep your indoor air as clean as possible**. Keep windows and doors closed unless it is very hot outside. Run an air conditioner if you have one, but keep the fresh-air intake closed and the filter clean to prevent outdoor smoke from getting inside. Seek shelter elsewhere if you do not have an air conditioner and it is too warm to stay inside with the windows closed.
4. **Do not add to indoor pollution**. When smoke levels are high, do not use anything that burns, such as candles and fireplaces. Do not vacuum, because vacuuming stirs up particles already inside your home. Do not smoke tobacco or other products, because smoking puts even more pollution into the air.
5. **Follow your doctor's advice about medicines and about your respiratory management plan if you have asthma or another lung disease**. Call your doctor if your symptoms worsen.
6. **Do not rely on dust masks for protection**. Paper "comfort" or "dust" masks commonly found at hardware stores trap large particles, such as sawdust. These masks will not protect your lungs from smoke. An “N95” mask, properly worn, will offer some protection. If you decide to keep a mask on hand, see the Respirator Fact Sheet provided by CDC’s National Institute for Occupational Safety and Health.
7. **Avoid smoke exposure during outdoor recreation**. Wildfires and prescribed burns—fires that are set on purpose to manage land—can create smoky conditions. Before you travel to a park or forest, check to see if any wildfires are happening or if any prescribed burns are planned.

Training Needs

All PPE should be used in accordance with OSHA regulations found at 29 CFR 1910 Subpart I (Personal Protective Equipment). Workers must receive training on and demonstrate an understanding of when to use PPE; what PPE is necessary; how to properly put on, use, take off, properly dispose of, and maintain PPE; and the limitations of PPE.