BY ORDER OF THE COMMANDER
CANNON AIR FORCE BASE (AFSOC)

CANNON AIR FORCE BASE
PAMPHLET 48-151

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Aerospace Medicine

THERMAL INJURY PREVENTION PROGRAM

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This pamphlet implements AFI 48-151, *Thermal Injury Prevention Program*, 7 April 2016, and establishes policies and procedures for Cannon AFB. It provides guidance for commanders and supervisors to prevent heat and cold stress related injuries at Cannon AFB, NM. It applies to maintenance crews and other personnel performing duties on the flight line or outdoors. This pamphlet takes into account that heavy winter clothing is available and worn by personnel who are subject to working outdoors. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, Management of Records, and disposed of in accordance with Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS) located at **https://www.my.af.mil/afrims/afrims/afrims/rims.cfm**. Additionally, if the publication generates a report(s), alert readers in a statement and cite all applicable Reports Control Numbers in accordance with AFI 33-324, *The Air Force Information Collections and Reports Management Program*. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, Recommendation for Change of Publication; route AF Form 847s from the field through the appropriate functional chain of command.

1. ROLES AND RESPONSIBILITIES.

1.1. 27th Special Operations Wing Commander (27 SOW/CC) will enforce base compliance with this program to ensure the health and safety of all personnel on Cannon AFB.

1.2. Implements and directs execution of the installation Thermal Injury Prevention Program (TIPP) through the installation Environment, Safety, and Occupational Health (ESOH) Council (IAW AFI 90-801, *Environment, Safety, and Occupational Health Councils*).

1.3. Appoints the installation Bioenvironmental Engineer (or local equivalent) as the TIPP manager.

1.4. **27th Special Operations Medical Group Commander** (27 SOMDG/CC) will be the final authority for thermal stress conditions for release to Cannon AFB Notices to Airmen (NOTAMS).

1.5. **27 Special Operations Aerospace Medicine Squadron (SOAMDS)/SGPB, Bioenvironmental Engineering (BE)** will:

1.5.1. Ensure thermal stress guidance is available to shop personnel through Air Force Occupational Safety and Health (AFOSH) inspections at the shop level.

1.5.2. Ensure the Wet Bulb Globe Temperature (WBGT) instrument is calibrated and available for daily use from 1 April to 1 October. The WBGT instrument will be deployed during normal duty hours Monday through Friday (except holidays or wing down days) when the ambient temperature is forecast to reach or exceed 85ºF and in support of exercises at the request of commanders.

1.5.3. Determine the heat category and flag color in accordance with Tables A2.1 and A2.2 and report this information to the 27 SOW Command Post as changes occur.

1.5.4. Investigate all thermal stress illnesses documented through the Air Force Safety Automated System (AFSAS).

1.5.5. Ensure wind chill guidance is provided to shop personnel through AFOSH inspections at the shop level.

1.5.6. Ensure during winter months, obtain outside ground temperature and wind speed from the base weather flight, determine the Wind Chill Temperature and Frostbite Risk Level and will notify the installation Command Post (575-784-2253) of the resulting Frostbite Risk Level. **NOTE:** BE only notifies Command Post if a risk may be present or occur.

1.6. **27 SOAMDS/SGPM, Public Health** will:

1.6.1. Provide thermal stress education and training on preventing and controlling heat induced illness and cold injuries, when requested or required by worker's duties.

1.6.2. Ensure thermal injuries and illnesses reported to PH are investigated, initiated in Air Force Safety Automated System (AFSAS) and closed within 30 days IAW requirements in AFI 91-204, *Safety Investigations and Reports*. **NOTE:** IAW AFI 33-332, *Air Force Privacy and Civil Liberties Program*, records retrieved by name or personal identifier are subject to Privacy Act requirements.

1.7. **27 SOW/CP, Command Post** will relay WBGT flag conditions and frostbite risk levels information to the base population via installation mass notification systems (ex: AtHoc and loud voice system) as deemed necessary.

1.8. **27 SOSS/OSW, Weather** will provide weather forecasts, current weather conditions and wind conditions via Joint Environmental Toolkit Portal (JET) located on SharePoint at the following **https://eis.afsoc.af.mil/sites/27Soss/OSW/Currentwx/default.aspx**.

1.9. **27 SOW Organizational Commanders** (Group/Squadron/Flight Commanders) will:

1.9.1. Enforce work-rest cycles and hydration requirements (see Attachment 2).

1.9.2. Ensure supervisors and workers receive training at least annually concerning the early signs of heat stress, the methods to minimize associated effects, and techniques for prevention of heat related illness.

1.10. **Unit Fitness Leaders** will determine whether physical training (PT) can be conducted outside during current weather conditions. Physical training leaders (PTLs) should consider conducting PT indoors when severe environmental conditions exist. Refer to AFI 36-2905, *Fitness Program*, Attachment 6, for environmental conditions required for PT testing. PT sessions should not be conducted outside when environmental conditions do not permit outdoor PT tests.

1.11. **Supervisors** will:

1.11.1. Ensure all thermal injury hazards are abated and that all Airmen and civilian workers comply with TIPP requirements. Understand the impacts of acclimatization (see Table A2.1) on the risk of thermal injury.

1.11.2. Understand the impacts of un-acclimatized work (see Table A2.2) on risk of thermal injury. **Note**: An individual is considered acclimatized if he or she has undertaken at least two continuous hours of work or exercise in five of the last seven days, or 10 of the last 14 days in the same environmental conditions as the proposed activity.

1.11.3. Routinely retrieve the thermal stress index from Command Post, and implement thermal stress safety procedures at shop level per Tables A2.1 and A2.2. Work center supervisors may have to adjust the work-rest cycles for operations that require heavy personal protective equipment.

1.11.4. Ensure all employees are trained to recognize thermal stress disorders and administer first aid treatment according to AFI 48-151, *Thermal Injury*.

1.11.5. Ensure employees are acclimatized in accordance AFI 48-151.

1.11.6. Monitor weather information, especially for evening and night shift personnel, and implement precautions and work/rest cycles at the shop level per Table A2.1.

1.11.7. Ensure workers wear cold protective clothing appropriate for the level of cold and physical activity at temperatures below 40ºF.

1.11.8. Ensure gloves are worn or metal handles are covered with an insulating material when the ambient temperature is 30ºF or less.

1.11.9. Encourage workers, if heavy work is done (shoveling, etc.), to change into dry clothing prior to re-entering a cold environment or going into a cold environment.

1.11.10. Ensure workers handling evaporative liquids such as gasoline, alcohol or cleaning fluids at temperatures below 40ºF take special precautions to avoid soaking clothes or gloves due to evaporative cooling of the liquids.

1.11.11. Brief shop personnel during fall and winter safety meetings on wind chill factors and follow the guidance provided in Tables A3.1, A3.2, A3.4 and A4.2.

1.11.12. Encourage him/her to change clothing immediately and seek treatment for hypothermia if a worker becomes immersed in water or their clothing becomes wet.

1.11.13. Report all thermal stress illnesses/injuries to 27 SOAMDS/SGPM, Public Health at 575-784-4926.

1.12. **Work center employees** will:

1.12.1. Understand the thermal risk aspects of work performed and complies with all risk mitigation strategies and program requirements, including training, work practices and the proper use, maintenance and storage of PPE. Understands the impacts of acclimatization on the risk of thermal injury (see A2.1).

1.12.2. Understands the impacts of un-acclimatized work (see A2.2) on risk of thermal injury. **NOTE:** An individual is considered acclimatized if he or she has undertaken at least two continuous hours of work or exercise in five of the last seven days, or 10 of the last 14 days in the same environmental conditions as the proposed activity.

1.12.3. Report all thermal stress illnesses to the work center's supervisor.

2. MONITORING HEAT STRESS.

2.1. BE will routinely monitor heat stress index during the summer months. The summer monitoring period will begin from 1 April to 1 October. The summer monitoring period may be increased or decreased based on seasonal variations.

2.2. When the predicted or forecasted outside temperatures reach 85ºF as a daily high, BE will perform heat stress monitoring at least four times during the hottest part of the day. Examples of monitoring schedules might be 1000, 1200, 1400, and 1600 or 0900, 1100, 1300, and 1500. The heat category is determined by the WBGT Index. The WBGT Index is NOT related to typical civilian "heat indexes". The WBGT Index is a combination of measurements, which take into account dry air temperature, relative humidity, and radiant heating. The Bioenvironmental Engineer has the field apparatus necessary to determine the WBGT Index.

2.3. When the WBGT reaches 85ºF at any point of the day, BE will then initiate heat stress monitoring hourly during normal duty hours. Tables A2.1 and A2.2 provide the Heat Categories, their corresponding WBGT Index range with corresponding color category, the recommended work/rest cycles (in minutes) and fluid intake guidelines. The recommended work/rest guidelines are established to prevent adverse heat-related health effects, and represent conditions under which it is believed that nearly all un-medicated, healthy workers may be repeatedly exposed without adverse health effects. The recommendations should not be used as a fine line between safe and dangerous levels, but should be used with good judgment concerning the working conditions and the individuals to ensure adequate protection for each situation. Table A2.4 provides examples of light, moderate, and heavy work referenced in Table A2.1.

2.4. BE notifies the Command Post (575-784-2253) of the heat stress condition/flag conditions determined by the WBGT index. **NOTE:** BE only notifies Command Post when flag conditions change.

2.5. The Command Post notifies all base agencies via the AtHoc system when flag conditions change.

2.6. Maintenance Operations Control Center (MOCC) does an ALL-CALL and notifies all the maintenance production superintendents, Telford Aviation, Sierra Nevada, and Battle Space.

2.7. **Supervisors** will:

2.7.1. Follow the guidelines in Table A4.1 if personnel show signs and/or symptoms of heat stress.

2.7.2. Be proactive with their work environment and work practices in order to help minimize the risk of heat stress.

2.7.2.1. Implement engineering controls when feasible as a first line of defense against heat stress to reduce the amount of heat to which an individual is exposed. BE may be consulted for guidance. Examples are below.

2.7.2.1.1. General ventilation such as fans to move cool air around to produce convection can be installed.

2.7.2.1.2. Evaporative cooling machines can be used outside to cool personnel working on the flight line and other outdoor locations.

2.7.2.1.3. Air conditioning should be used to cool indoor work areas.

2.7.2.1.4. Establish cool rooms and shaded areas to allow workers a place to take breaks.

2.7.2.1.5. Use power tools when possible to reduce manual labor.

2.7.2.2. Work Practices: When personnel have to work in hot environments, supervisors must implement work practices to prevent heat stress disorders.

2.7.2.2.1. Use the work/rest cycles and fluid intake recommendations in Tables A2.1 and A2.2.

2.7.2.2.2. Ensure personnel are trained to recognize and treat heat disorders and the actions to take in case of an emergency (see Table A.4.1).

2.7.2.2.3. When possible schedule heavier workloads during cooler parts of the day, i.e., night or early morning.

2.7.2.2.4. Ensure personnel pace themselves and try not to finish work at a rapid pace.

2.7.2.2.5. When possible assign extra workers to jobs if there are time constraints. Use relief workers to give individuals enough rest time. Personnel on medication or medical waiver may require additional rest periods if at greater risk for heat stress.

3. MONITORING COLD STRESS.

3.1. The base weather flight will post current weather conditions and forecasted weather conditions to include wind speed on SharePoint.

3.2. During winter months, BE personnel will obtain temperature and wind speed from the base weather flight at the beginning of the duty day (Monday through Friday except holidays or wing down days). BE personnel will then determine the Wind Chill Temperature and Frostbite Risk Level (FRL) using Attachment 3 of this pamphlet.

3.3. BE will notify the installation Command Post (575-784-2253) of the resulting FRL. **NOTE:** BE only notifies Command Post if a risk may be present or occur.

3.4. The Command Post notifies all base agencies via the AtHoc system when conditions change.

3.5. MOCC does an ALL-CALL and notifies all the maintenance production superintendents, Telford Aviation, Sierra Nevada, and Battle Space.

3.6. **Supervisors** will:

3.6.1. Follow the guidelines in Table A3.4 if frostbite risks exist and Table A4.2 if personnel show signs and/or symptoms of cold injuries.

3.6.2. Be proactive with their work environment and work practices in order to help minimize the risk of cold stress.

3.6.2.1. Implement engineering controls when feasible as a first line of defense against cold stress to reduce the degree of individual exposures to hazardous cold conditions. BE may be consulted for guidance. Examples are below.

3.6.2.1.1. Heating systems and approved space heaters can be used to heat personnel.

3.6.2.1.2. Establish warm rooms to allow workers a place to take breaks, dry/remove cold weather gear, and means to hydrate.

3.6.2.2. Implement work practices to prevent cold stress disorders. Contact BE for assistance and/or consultation.

3.6.2.2.1. Use frostbite risk level colors in Table A3.3 provided by BE through the Command Post to determine work/rest cycles in Table A3.4.

3.6.2.2.2. Ensure personnel are trained to recognize and treat cold disorders and the actions to take in case of an emergency.

3.6.2.2.3. When feasible, schedule heavier workloads during warmer parts of the day.

3.6.2.2.4. Ensure personnel pace themselves and try not to finish work at a rapid pace.

4. WATER INTAKE. Water intake levels should coincide with BE recommendations in accordance with Attachment 2, Tables A2.1 and A2.2, WBGT Stages, Temperature Ranges, and Flag Colors.

5. PREVENTION MEASURES. The key to preventing thermal illness and/or injury is for commanders, supervisors, and individuals at all levels to have an awareness of thermal risk factors. Any training or task involving physical exertion in a hot or cold climate should be considered a high-risk activity. Risk of illness and/or injury is based primarily upon environmental conditions, work rate, and clothing worn. When there is a thermal casualty risk, it is the commander's duty to ensure that resources are available to undertake an appropriate risk assessment and employ risk management actions. Commanders, supervisors, and workers will be familiar with AFI 48-151 and the contents of this wing pamphlet for all thermal stress related conditions.

STEWART A. HAMMONS, Colonel, USAF
Commander

ATTACHMENT 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFPD 48-1, *Aerospace Medicine Enterprise,* 23 August 2011

AFI 48-151, *Thermal Injury Prevention Program,* 7 April 2016

AFI 33-324, *Air Force Information Collections and Reports Management Program,* 6 March 2013

AFI 33-332, *Air Force Privacy and Civil Liberties Program,* 12 January 2015

AFMAN 33-363, *Management of Records,* 9 June 2016

AFI 36-2905, *Fitness Program,* 21 October 2015

AFI 91-204, *Safety Investigations and Reports,* 11 January 2016

TB MED 508, *Prevention and Management of Cold-Weather Injuries,* 1 April 2005

Threshold Limit Values and Biological Exposure Indices, published by the American Conference of Governmental Industrial Hygienists

Adopted Forms

AF Form 847, *Recommendation for Change of Publication*

Abbreviations and Acronyms

ABU—Airman Battle Uniform

AFSAS—Air Force Safety Automated System

BE—Bioenvironmental Engineering

CC—Commander

DSN—Defense Switching Network

F—Fahrenheit

FRL—Frostbite Risk Level

FSO—Flight Surgeon's Office

FSS—Force Support Squadron

JET—Joint Environmental Toolkit Portal

MOCC—Maintenance Operations Control Center

NOTAMS—Notices to Airmen

OPR—Office of Primary Responsibility

PT—Physical Training

PTL—Physical Training Leader

SOAMDS—Special Operations Aerospace Medicine Squadron

SOMDG—Special Operations Medical Group

SOW—Special Operations Wing

TIPP—Thermal Injury Prevention Program

WBGT—Wet Bulb Globe Temperature

Terms

Acclimatization—A series of physiological adjustments, which occur when an individual is exposed to a hot or cold climate. In simple terms, this is considered a break-in period to help personnel slowly adjust to hot and cold environments.

Cold Injury—Cold environments pose a threat to the individual if they exceed the capacity of the body's thermo-regulatory response mechanisms. The main hazards are ***hypothermia*** associated with a fall in the body's core temperature and/or ***tissue damage*** that falls under the broad headings of freezing cold injury (FCI) and non-freezing cold injury (NFCI). For the purpose of this pamphlet the term 'Cold Injury' is all embracing and applies to an individual who becomes incapacitated as the result of a drop in core body temperature, FCI or NFCI.

Heat Illness—Traditionally heat illness has been divided into ***heat exhaustion*** and ***heat stroke***. In practice the division is difficult to define, thus, for the purpose of this pamphlet the term 'Heat Illness' is all embracing and applies to an individual who becomes incapacitated as the result of a rise in core body temperature.

Heat Stress—The net heat load to which a worker may be exposed from the combined contributions of metabolic cost of work, environmental factors (air temperature, humidity, air movement, etc.) and clothing. In simple terms, heat stress is the body burden from these three categories above.

Heat Stress Posting—Visual notification of heat stress flag conditions, work rest cycles and or special personal protective equipment.

May—Indicates an acceptable or satisfactory method of accomplishment.

Should—Indicates a preferred method of accomplishment.

Thermal Stress—The common term used to cover both heat and cold stress.

Wet Bulb Globe Temperature—The WBGT is an instrument used to measure the heat stress index.

Will—Indicates a mandatory requirement and is also used to express a declaration of intent, probability, or determination.

Work/Rest Cycle—A guidance schedule for personnel to ensure adequate rest breaks are taken to avoid heat stress disorders.

ATTACHMENT 2

HOT WEATHER GUIDANCE

Table A2.1. Heat Stress Risk Colors.

WBGT Range (F)	WBGT Range (C)	Severity	Color
82 – 84.9	27.8 – 29.4	Low	Green
85 – 87.9	29.4 – 31.1	Moderate	Yellow
88 – 89.9	31.1 – 32.2	Severe	Red
>90	>32.2	Extreme	Black

Table A2.2. Guidelines for Average Acclimatized Personnel.

Heat Cat/Flag Color	WBGT (F)	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
No Flag	78 - 81.9	No Limit	0.5	No Limit	0.75	40/20 min	0.75
Green	82 - 84.9	No Limit	0.5	50/10 min	0.75	30/30 min	1.0
Yellow	85 - 87.9	No Limit	0.75	40/20 min	0.75	30/30 min	1.0
Red	88 - 89.9	No Limit	0.75	30/30 min	0.75	20/40 min	1.0
Black	> 90	50/10 min	1.0	20/40 min	1.0	10/50	1.0

Table A2.3. Guidelines for Average Un-acclimatized Personnel.

Heat Cat/Flag Color	WBGT (F)	EASY WORK		MODERATE WORK		HARD WORK	
		Work Rest Cycle	Water Intake Qt/hr[a]	Work[b] Rest[c] Cycle	Water Intake Qt/hr	Work Rest Cycle	Water Intake Qt/hr
No Flag	78 - 81.9	No Limit	0.5	50/10 min	0.75	30/30 min	0.75
Green	82 - 84.9	No Limit	0.5	40/20 min	0.75	30/30 min	1.0
Yellow	85 - 87.9	No Limit	0.75	30/30 min	0.75	20/40 min	1.0
Red	88 - 89.9	50/10 min	0.75	20/40 min	0.75	10/50 min	1.0
Black	> 90	40/20 min	1.0	10/50 min	1.0	Not allowed	Not applicable

a. For all work rates, individual water requirement may vary by +/- 0.25 quart/hr. A quart is roughly equal to 1 liter (0.95L).

b. Rest means minimal physical activity, i.e. sitting or standing, accomplished in the shade if possible.

Table A2.4. WBGT Adjustments for Clothing.

Clothing Item	WBGT Adjustment (Light work)	WBGT Adjustment (Moderate work)
Combat armor (+ABU)	+3°C/+5°F	N/A
Fire-fighting gear or similar clothing	+6°C/+10°F	+12°C/+20°F

Table A2.5. Guide to Determination of Workload.

EASY WORK	MODERATE WORK	HARD WORK
- Walking on hard surface @ 2.5 mph with < 30 lb load - Guard duty - Drill and Ceremony	- Walking on hard surface @ 3.5 mph with < 40 lb load - Walking on loose sand @ 2.5 mph with no load - Light maintenance work - Construction equipment operation - Field Assaults	- Walking on hard surface @ 3.5 mph with > 40 lb load - Walking on loose sand @ 2.5 mph with load - Loading and unloading pallets - Dragging hoses or lines

ATTACHMENT 3

COLD WEATHER GUIDANCE

Table A3.1. Equivalent Chill Temperature.

WIND SPEED (mph)	TEMPERATURE (°F)											
	10	**5**	**0**	**-5**	**-10**	**-15**	**-20**	**-25**	**-30**	**-35**	**-40**	**-45**
	EQUIVALENT CHILL TEMPERATURE											
5	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95

Note: Wind Chill (°F) = $35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$;
T = Air Temperature (°F) and V = Wind Speed (mph)

Table A3.2. Cold Stress Risk Determination (Table values indicate time in minutes to frostbite).

Wind Speed (mph/kph)	AIR TEMPERATURE (°F/°C)											
	10/-12	5/-15	0/-21	-5/-21	-10/-23	-15/-26	-20/-29	-25/-32	-30/-34	-35/-37	-40/-40	-45/-43
5/8	>120	>120	>120	>120	31	22	17	14	12	11	9	8
10/16	>120	>120	>120	28	19	15	12	10	9	7	7	6
15/24	>120	>120	33	20	15	12	9	8	7	6	5	4
20/32	>120	>120	23	16	12	9	8	8	6	5	4	4
25/40	>120	42	19	13	10	8	7	6	5	4	4	3
30/48	>120	28	16	12	9	7	6	5	4	4	3	3
35/56	>120	23	14	10	8	6	5	4	4	3	3	2
40/64	>120	20	13	9	7	6	5	4	3	3	2	2
45/72	>120	18	12	8	7	5	4	4	3	3	2	2
50/81	>120	16	11	8	6	5	4	3	3	2	2	2

NOTE: Time in minutes until the occurrence of cheek frostbite in the most susceptible 5 percent of personnel; wet skin could significantly decrease the time for frostbite to occur

Table A3.3. FROSTBITE RISK LEVEL (FRL) COLORS.

Severity	Color	Description
Low	Green	Freezing possible but unlikely
Moderate	Yellow	Freezing could occur in 10-30 minutes
Severe	Red	Freezing could occur in 5-10 minutes
Extreme	Black	Freezing could occur in <5 minutes

Table A3.4. List of recommended preventive measures to decrease frostbite risk.

Frostbite Risk Level	Preventive Measures
Low	·Recommended work/rest (W/R) cycle: 50 minutes work/10 minutes warming ·Increase surveillance with self and buddy checks ·Wear appropriate layers and wind protection for the work intensity ·Cover exposed flesh if possible ·Wear Vapor Barrier (VB) boots below 0 °F ·Provide warming facilities below 20 °F ·Avoid sweating
High	·Recommended W/R cycle: 40 minutes work/20 minutes warming ·Mandatory buddy checks every 20-30 minutes ·Wear appropriate layers and All Purpose Environmental Clothing System (APECS); Protect head, face and hands ·Cover exposed flesh ·Wear VB boots below 0 °F ·Provide warming facilities ·Avoid sweating
Severe	·Recommended work/rest (W/R) cycle: 30 minutes work/30 minutes warming ·Mandatory buddy checks every 10 minutes ·Wear appropriate layers and APECS or cold weather parka; Protect head, face and hands ·Wear VB boots ·Provide warming facilities ·Work groups of no less than two personnel ·No exposed skin ·Stay Active ·Avoid sweating
Extreme	·Mission critical work only due to extreme risk ·Keep task duration as short as possible ·Wear appropriate layers, cold weather parka, wind protection; Protect head, face and hands ·Wear VB boots ·Provide warming facilities ·Work groups of no less than two personnel ·No exposed skin ·Stay Active ·Avoid sweating
NOTE: Work/Rest (W/R), Vapor Barrier (VB), All Purpose Environmental Clothing System (APECS)	

ATTACHMENT 4

TRAINING AIDS

Table A4.1. Symptoms and First Aid Treatment for Heat Stress.

Illness	Signs and Symptoms	First Aid
Heat Syncope	Fainting when standing erect and immobile in the heat.	Remove to cool area. Allow to recline and provide cool water. Recovery will be prompt and complete.
Heat Cramps	Active sweating, muscle cramps.	Remove to cool area. Massage extremities. Contact medical facility.
Heat Exhaustion	Profuse sweating, headache, weakness, and nausea; skin cool and moist.	Remove to cool area. Elevate feet. Loosen clothing and apply wet cloths. Evacuate to medical facility.
Heatstroke-Medical Emergency	High body temperature; skin dry and hot; unconsciousness, convulsions, or delirium.	THIS IS A MEDICAL EMERGENCY. Call medical facility first. Lower body temperature immediately. Remove clothing, immerse in water, if available. Otherwise, sprinkle with water and fan to increase evaporation, massage extremities and trunk. Move to medical facility. Continue cooling measures during transportation.

Table A4.2. Symptoms and First-Aid Treatment for Cold Injuries.

Illness/Injury	Symptoms	First Aid
Muscle Injuries	Muscle and tendon tears	Active warm up, sufficiently energetic and prolonged to ensure that the whole body is warm.
Shivering	Self-explanatory; reduced performance in manual skills that require steadiness.	Remove individual from environment and provide adequate warming during rest periods.
Raynaud's Disease/Syndrome	Cold at a severity that does not affect normal people may cause severe arterial vasoconstriction, most commonly affecting the fingers, in individuals with Raynaud's	Remove individual from environment and provide adequate warming during rest periods. Chemical hand warmers may be necessary for prevention.
Reduced manual dexterity	The fingers are much less sensitive in the cold with subsequent loss of manual dexterity.	Remove individual from environment and provide adequate warming during rest periods.
Loss of normal activity/functions	Making simple mistakes, misinterpret sights or sounds, reduced coordination, visual acuity, general awareness and slowed reflexes. May even cause hallucinations, particularly at altitude.	Remove individual from environment and provide adequate warming during rest periods.

Non Freezing Cold Injury (i.e. Trench Foot)	The affected areas are initially cold and numb. Trench foot gives the sensation of "walking on cotton wool." Joint stiffness and affected areas are cold, swollen, and blotchy pink-purple or blanched.	Remove the person from the cold environment and allow the affected body part to rewarm spontaneously. After rewarming, the feet may become hyperemic, hot, and red with paraesthesia or pain, often similar to electric shocks.
Frostnip	Painful exposed skin blanches and loss of sensation but remains pliable.	The affected area should be warmed by placing it in the armpit or under clothing. Tingling is followed by hyperemia and within a few minutes sensation is restored and normal activity can be resumed.
Frostbite	Tissues are hard, insensitive, and white or mottled (usually affecting the feet, hands, ears, nose, and cheeks).	No attempt should be made to thaw frostbite if there is any chance of the affected area becoming re-frozen. The freeze-thaw-re-freeze cycle causes greater damage than continuous freezing. It is safer to walk on frozen feet up to 72 hours.
Hypothermia	Profound shivering, slurred speech, psychological symptoms including aggressive or withdrawn behavior, progressive reduction in the shivering response and loss of consciousness.	Remove the casualty from the cold environment. Movement must be gentle in order to avoid triggering cardiac arrest. Layers of insulating material should be placed on top of the casualty's clothing, including the head, and covered with a layer that is water and wind proof.

NOTE: For all injuries/illnesses, prevention measures include proper selection and use of cold weather gear and adequate warming during rest periods.