

**1 December 1997**



**Weather**

**COLD WEATHER WORKING CONDITIONS**

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

---

**NOTICE:** This publication is available digitally on the OO ALC WWW site at: <http://scsweb.hill.af.mil/pdl/pubs.htm>. Personnel with no access to electronic media may view the publication at the Base Master Publications Library, 75 CS/SCSP.

---

OPR: 75 AMDS/SGPB  
Supersedes OO-ALC-HAFBR 105-2,  
20 October 1987

Certified by: Major James E. Bohne, Jr  
Pages: 7  
Distribution: F

---

This instruction implements *AFPD 15-1, Atmosphere and Space Environmental Support*. This instruction sets up guidelines to aid in the management of cold weather operations. These guidelines are established for the prevention of personnel injury due to exposure to cold. This instruction applies to OO-ALC, Hill AFB, and tenant organizations on Hill AFB.

**SUMMARY OF REVISIONS**

This revision updates office symbols and changes the reference to civilian cold weather clothing requirements in paragraph 4. A | indicates revisions from the previous edition.

**1. POLICY.** Hill AFB is subject to cold weather extremes during the months of December, January, and February. Low early morning temperatures, coupled with strong winds, frequently produce equivalent chill temperatures below -20<sup>o</sup> F, which are hazardous to personnel working outside. The policy of this command is during these periods of extreme cold weather, personnel will use the buddy system when working out of doors to check on each other for any injury due to inclement weather (reference Attachment 1).

**2. RESPONSIBILITIES :**

2.1. When the equivalent chill temperature reaches 0<sup>o</sup> F, Weather Flight (75 OSS/OSW) will issue an Observed Weather Advisory on the Automated Weather Dissemination System (AWDS). The advisory will be disseminated on the AWDS when the condition is first observed. Thereafter, the advisory will be appended to each hourly weather observation transmitted on the AWDS until the criterion is no longer occurring. A transmission on the AWDS will be made noting the end of the criterion. The initial and ending advisory messages will be appropriately “flagged” on the AWDS to alert

the receiving organizations that an advisory has been issued. Reference Attachment 2 for equivalent chill temperature chart.

2.2. The Command Post (75 ABW/CP) will, in turn, notify each directorate and tenant organization control center having outside mission responsibilities (reference Attachment 3).

2.3. Should conditions such as “minimize” make the use of the AWDS or the telephone impossible, notification of appropriate agencies will be made by the most expedient means available, such as a runner.

2.4. The directorate, staff office, or tenant organization control center will tell senior officers and all organizational activities with outdoor work stations of the adverse weather conditions. Constant update of weather conditions will occur as new information is received from the Command Post. When equivalent chill temperature drops below  $-20^{\circ}$  F, supervisors will report the number and location of personnel working outdoors to their control centers and alert offices.

2.5. It is the responsibility of each supervisor to monitor weather conditions through their directorate, staff office, or tenant control centers or alert offices before and during outdoor activities. If weather conditions appear to be unfavorable or deteriorating, supervisors should immediately check with their control center or alert office and ask for weather status. Any supervisor observing an outdoor operation which is unsafe due to weather conditions will immediately stop operations and ask for instructions from the control center or alert office. Supervisors will direct compliance with these instructions to make sure all personnel are protected against cold weather injury.

### 3. LIMITATIONS:

3.1. When the equivalent chill temperature reaches  $-20^{\circ}$  F, personnel should be cautioned to wear proper clothing and be allowed the freedom to warm themselves frequently enough to prevent pain and do so without seriously reducing operational readiness.

3.2. With equivalent chill temperatures between  $-20^{\circ}$  F and  $-30^{\circ}$  F, personnel should only work in 30 minute shifts. At the end of each 30 minute period, personnel should be sent to a warm area until all body areas are warmed back to normal temperature. At  $94^{\circ}$  F body temperature, a person is suffering from hypothermia and will require prompt medical attention.

3.3. With equivalent chill temperature levels at  $-30^{\circ}$  F and below, exposure for any length of time becomes extremely dangerous. All outdoor work except emergencies will cease and personnel will be brought indoors. All emergency work will be approved by the director or unit commander, whichever is applicable.

3.4. Contact Frostbite. To prevent contact frostbite, workers should wear anticontact gloves. When cold surfaces below  $19.4^{\circ}$  F are within reach, a warning should be given to each worker to prevent inadvertent contact by bare skin. If the air temperature is  $0^{\circ}$  F or less, the hands should be protected by mittens. Machine controls and tools for use in cold conditions should be designed so that they can be handled without removing the mittens.

3.5. These limitations are a guide for supervisors, and are to be used with discretion.

**4. RECOMMENDED CLOTHING GUIDELINES:**

4.1. The way personnel dress can be very important as to how much of an effect weather has upon them. The following clothing is recommended to prevent cold weather exposure:

4.1.1. Full leg, arm, and body protection with thermal underwear underneath.

4.1.2. Footwear and gloves with insulation qualities sufficient to protect against moisture and cold.

4.1.3. Head covering including face mask in order to protect the entire head.

4.2. Cold weather clothing is available to military personnel through individual equipment issue.

4.3. Cold weather clothing for civilian workers will be provided when authorized by specific Air Force directives.

ROSS N. MILLER, Lt Colonel, USAF, BSC  
Commander, Aerospace Medicine Squadron

**Attachment 1****BUDDY SYSTEM**

**A1.1.** During periods of adverse weather, personnel working outdoors (exposed to weather) should perform their duties with a co-worker, when authorized by supervision, to check each other for signs of frostbite, hypothermia, excessive chilling, or any other injury.

**A1.2.** Responsibilities of the supervisors and team members are to be aware of decreased dexterity, increased work times involved with cold temperatures, and the hazards associated with cold weather exposure. Personnel must apply appropriate caution and constantly monitor themselves and others for symptoms of frostbite and hypothermia.

A1.2.1. Frostbite. The symptoms are loss of feeling in the affected area, and a “dead white” appearance of the affected flesh. Particular attention must be paid to the nose, cheeks and ears for visible signs of frostbite. If frostbite is suspected, obtain medical advice from qualified medical personnel immediately.

A1.2.2. Hypothermia. The symptoms of hypothermia (exposure) are fits of shivering, vague and slurred speech, memory lapses, fumbling hands, lurching walk, drowsiness and exhaustion, and apparent unconcern about physical discomfort. Personnel are subject to hypothermia when exposed to prolonged freezing temperatures, but symptoms are usually noticed by others before the victim is aware of them. If hypothermia is suspected, medical personnel will be contacted immediately, as hypothermia can result in death if untreated.

## Attachment 2

**EQUIVALENT CHILL TEMPERATURE**

The equivalent chill temperature (also called wind chill factor) is an approximation of the additional cooling effect of wind on the human body. Specifically, it is the effect of any combination of temperature and wind, expressed as the loss of body heat in kilogram calories per hour per square meter of skin surface. The index is based on the cooling rate of uncovered flesh in the shade. It is only an approximation because of the individual variations in body shape, size and metabolic rate. AFVA 161-1, Wind Chill Chart, contains the Fahrenheit scale and gives wind speed in miles per hour and knots. Instructions for its use are listed with the chart. The chart does not consider variations in wind speeds, therefore, the most representative chill temperature would be derived by using the mean wind speed. One must remember that equivalent chill temperatures are, at best, only a rough estimate of the cooling rate of the uncovered skin surface.

The formula for equivalent wind chill temperature was published by Siple and Passl in 1945 based on experiments in Antarctica in 1939. This information is extracted from "Weatherwise", Dec 1981.

$$T_e = 33 - \frac{(10.45 + 10\sqrt{V - V_0})(33 - T)}{22.04}$$

where

$T_e$  = wind chill equivalent temperature in degrees Celsius

$V$  = wind speed expressed in meters per second\*

$T$  = air temperature in degrees Celsius

\*1 knot = 0.514791 meters per second

In the derivation of this formula, there is an assumption that 4 mph is the baseline wind speed; therefore, when you calculate using any speed less than 4 mph (1.79 meters per second) you will have  $T_e \leq T$ . It is general practice to ignore this unsettling behavior and set  $T_e = T$  for speeds of 4 mph or less.

## EQUIVALENT CHILL TEMPERATURE (°F) AS A FUNCTION OF TEMPERATURE AND WIND SPEED

WIND SPEED		AIR TEMPERATURE (°F)																	
		35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50
mph	km																		
1-5	1 - 4	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50	-55
6-10	5 - 9	20	15	10	5	0	-10	-15	-20	-25	-35	-40	-45	-50	-60	-65	-70	-75	-85
11-15	10-13	15	10	0	-5	-10	-20	-25	-30	-40	-45	-50	-60	-65	-70	-80	-85	-90	-100
16-20	14-17	10	5	0	-10	-20	-25	-30	-40	-45	-55	-60	-65	-75	-80	-90	-95	-105	-110
21-25	18-22	10	0	-5	-15	-20	-30	-35	-45	-50	-60	-65	-75	-80	-90	-95	-105	-110	-120
26-30	23-26	5	0	-10	-20	-25	-35	-40	-50	-55	-65	-70	-80	-85	-95	-100	-110	-115	-125
> 30	> 28	5	-5	-10	-20	-30	-35	-40	-50	-60	-65	-75	-80	-90	-100	-105	-115	-120	-130
(Greater Wind Speeds Add Little Effect )		LITTLE DANGER (Green)				INCREASING DANGER (Yellow)						GREAT DANGER (Red)							

Instructions: Enter chart with local air temperature and wind speed; intersection gives equivalent chill temperature (i.e., the temperature which would produce the same cooling effect without wind).

### NOTES:

1. Danger zones refer to likelihood of frostbite to exposed flesh. When the equivalent chill temperature is below  $-70^{\circ}\text{F}$ , freezing may occur in less than 30 seconds.
2. Wind varies with location and therefore must be estimated on site. Artificial wind can also be a problem, and a danger of frostbite is greatly increased by riding in open vehicles or exposure to prop wash.
3. Clothing selection and its proper use are of great importance. Significant protection is offered by small items such as light gloves and use of a parka hood to shield face from wind.
4. Frostbite is preventable through alert observance of proper precautions. Know and use them!

**Attachment 3**

**ORGANIZATIONS REQUIRING NOTIFICATION OF ADVERSE WEATHER WORKING  
CONDITIONS**

Command Post (75 ABW/CP)

Aircraft Directorate (OO-ALC/LA)

Commodities Directorate (OO-ALC/LI)

ICBM Product Directorate (OO-ALC/LM)

Technology and Industrial Support Directorate (OO-ALC/TI)

649th Combat Logistics Support Squadron

649th Munitions Squadron

419th Fighter Wing Maintenance Commander

388th Operations Support Squadron Maintenance Operations Center (MOC)

DRMO/UAI Hill AFB

405 CLSS/CC (duty hours only)

84 RADES Unit Administration

75th ABW Base Operations

Notify, in turn:

Disaster Preparedness

Base Operations and Training

Security Police Desk Sergeant

Vehicle Transportation

Civil Engineering Emergency

Base Plans

75th Support Squadron (Range), Range Controller

Base Supply Squadron Supply Alert

Communications Squadron