UNIVERSITY
OF WOLLONGONG
AUSTRALIA

UOW SAFE@WORK

THERMAL COMFORT GUIDELINES

Contents

1 Introduction

Extremes in temperature in either hot or cold conditions can contribute to thermal discomfort. The risk to the health of workers increases as the conditions move further away from those considered as comfortable. Heat strain/illness can arise from working in high air temperatures, exposure to high thermal radiation and/or high levels of humidity. Hypothermia arises when a person gets an abnormally low body temperature as a result of exposure to environments that are too cold. Both of these conditions are potentially fatal.

It is important to distinguish between a condition that threatens health and safety and a feeling of discomfort. What is considered comfortable for one person may not be the same as for another. Therefore the feeling of being comfortable is subjective and it can often be difficult to satisfy everyone working within the same thermal environment.

This document provides guidelines on strategies to address thermal comfort issues including the identification of hazards and control of risks in thermal work conditions (hot or cold environments). This document covers environments where workers (including contractors) or students may be required to conduct work tasks or activities.

2 Responsibilities

2.1 Managers

Managers are responsible for the overall implementation of this guideline in their respective work area. This includes:

- establishment of a systematic process for regular review of hazards associated with hot and cold environments;
- ensure workers are aware of their responsibilities, and are provided with adequate information, instruction, training and PPE (i.e. sunscreen, hats).

2.2 Supervisors

Supervisors are to facilitate the risk management approach by ensuring that hazards are identified and are communicated to workers, and that corrective actions/control measures are identified and implemented. Supervisors are responsible for ensuring that the work environment and the work itself, is safe.

2.3 Workers

Workers have a responsibility to adopt the required controls, e.g. wearing of PPE, for working in hot or cold environments and to reporting conditions which may affect their work capability to their supervisor. Workers should know how to recognise the warning signs if their health is being affected by work in hot or cold conditions.

2.4 Workplace health and safety unit

The WHS Unit is responsible for providing advice and technical support regarding the hazards and controls associated with working in thermal environments. This includes administrative arrangements such as provision of training in hazard and risk management processes.

3 Thermal comfort

3.1 Optimal Working Conditions

Thermal comfort is affected by many factors, including air temperature, air movement, floor temperature, humidity, clothing, the amount of physical exertion, average temperature of the surroundings and sun penetration. Generally comfortable conditions for people working indoors performing light sedentary work are as follows:

- between 20 and 26 degrees Celsius, depending on the time of year and clothing worn.
- relative humidity 30-60%
- optimal air movement 0.1-.05 m/s (naturally ventilated), 0.1-0.2 m/s (air-conditioned)

Workers involved in physical exertion usually prefer a lower temperature range. The means of maintaining a comfortable temperature will depend on the working environment and the weather, and could include any of the following:

- air-conditioning
- fans
- having access to cool drinking water
- electric heating
- open windows
- building insulation
- the layout of workstations
- direct sunlight control :- providing shading for windows and outdoor work
- controlling air flow and the source of drafts
- wearing appropriate clothing for conditions
- providing rest breaks in cool well ventilated areas
- shielding/enclosing hot processes
- rescheduling work or particular tasks to cooler parts of the day

3.2 Thermal Discomfort

In many cases, although we feel considerable discomfort, the work conditions are such that we face no significant risk of succumbing to the serious health and safety problem of heat illness. However, working conditions that cause heat illness will also cause heat discomfort. People who work indoors completing sedentary tasks - for example, working in an office - are very unlikely to be at risk of suffering heat illness. Any heat problems they experience are far more likely to be due to heat discomfort.

However there are medical conditions including cardiovascular diseases, high/low blood pressure, respiratory conditions and kidney disease that could make a person more likely to suffer health effects whilst working in uncomfortable conditions. Also older people and women who are pregnant may be more suseciptible to health effects especially from heat related discomfort. Special consideration may be given to people with existing medical conditions. In the first instance you should discuss any medical conditions with your supervisor/manager. For more information refer to the Workplace adjustment procedure.

If a significant proportion of people are experiencing discomfort in a work area for a long period of time the causes of the discomfort should be investigated. The following factors should be considered in context of the specific workplace, activities and tasks.

- level of physical activity required to perform tasks
- temperature in the area
- whether the work performed by staff and students involves safety critical tasks such as operating machinery or using hazardous chemicals
- the number of people working in the area
- specific individual needs such as those arising from medical conditions
- concerns expressed from staff /students

The means of addressing longer term thermal discomfort issues could include any or a combination of the ways mentioned in section 3.1.

4 Hot, Cold and Wet Environments

Working in hot, cold or wet conditions is a workplace hazard similar to others inherent to a University environment and is to be managed accordingly to prevent negative health effects. A risk management approach incorporating the process of hazard identification, risk assessment and control is required to be undertaken to ensure that hazards do not adversely affect the health and safety of staff or students. As with any other workplace hazard, consultation with workers must occur to ensure that the process is as effective as possible.

Both personal and environmental factors should be considered when assessing any risks to health from working in a very hot, very cold or wet environment. Personal factors include the level of physical activity, the amount of clothing worn, and the duration of exposure. Environmental factors include air temperature, the level of humidity, air movement and radiant heat.

4.1 Recognising signs and symptoms of heat stress and hypothermia

The environmental conditions and the physical well-being of workers should be monitored when work involves prolonged or repeated exposure to heat or cold. It is important that workers are able to recognise the early signs and symptoms of heat strain/illness or cold illness/hypothermia and that they report any problems immediately.

Signs and symptoms of heat illness include feelings of sickness, nausea, dizziness, weakness, clumsiness, collapse and convulsions. If a person appears to be suffering from heat-related stress:

- remove them from the heat
- loosen their clothing, remove PPE
- have them rest in a cool, well-ventilated area
- encourage them to drink cool (not cold) fluids
- obtain medical assistance ASAP

Signs and symptoms of cold-related illnesses usually develop slowly and include numbness in extremities (fingers, toes), loss of fine motor co-ordination, stiffness or pain, slurred speech and drowsiness, slow, irregular breathing and heartbeat/pulse, shivering. If a person appears to be suffering from hypothermia:

- gently move the person out of the cold. If going indoors isn't possible, protect the person from the wind, especially around the neck and head. Insulate the individual from the cold ground.
- gently remove wet clothing. Replace wet things with warm, dry coats or blankets.
- if further warming is needed, do so gradually. For example, apply warm, dry compresses to the centre of the body.
- offer the person warm, sweet, non-alcoholic drinks.
- obtain medical assistance ASAP

4.2 Working in Hot Environments

There are times when tasks or activities are required to be undertaken in hot environments. These environments, e.g. deserts or working in a foundry, can place people in situations of increased stressed, impose limitations and risk of heat illnesses. We are more likely to be exposed to hot environments due to the nature of where we work and the types of activities we encounter.

Working in hot environments presents particular hazards which need to be considered before the worker is required to enter into the area. Sufficient planning is required to ensure that the risk management approach can be used and implemented. If it is not possible to eliminate exposure to extreme heat, the risk of heat strain and exhaustion must be minimised. For example:

- increase air movement using fans
- isolate workers from indoor heat sources
- removing heat from hot processes using local exhaust ventilation
- altering working conditions so work is performed during cooler parts of the day
- using mechanical aids for manual tasks
- providing shading for outdoor work
- wearing light clothing
- job rotation
- slowing down the pace of work
- providing cool drinking water
- providing cool rest areas

4.3 Working in Cold Environments

Working in cold environments, e.g. desert and snow conditions, can impose unique hazards and risks to a person undertaking a task/activity in this type of temperature. Sufficient planning using the risk management approach is required to ensure that people are not placed at risk in this type of environment. If it is not possible to eliminate exposure to extreme cold, the risk of hypothermia must be minimised.

For Example:

- providing localised heating
- providing shelter against wind and rain
- wearing clothing that protects against the cold
- job rotation

4.4 Working in Wet Environments

As part of their normal duties, University staff and persons on field trips may be required to work outside in wet weather. Working in wet weather conditions may change the nature of the hazards and risks associated with a particular job or task.

Generally, the University will attempt to minimise any discomfort due to wet weather by providing appropriate personal protective equipment or scheduling alternative duties (if available). If it is not possible to eliminate exposure to wet conditions, the risks must be minimised. For Example:

- providing shelter against wind and rain
- wearing clothing that protects against the wet conditions
- job rotation

If extreme weather events are forecast such as high winds, flash flooding or severe storms then work should be postponed until after these events have past. If you are working in the field it is important that you monitor the conditions continually and that you are prepared if weather conditions change suddenly.

5 Related Documents

- Risk management
- Fieldwork
- Working Alone and After Hours Work Guideline

6 Reference Documents

- Work Health and Safety Act 2011
- Work Health and Safety Regulation 2011
- Code of Practice – Managing the Work Environment and Facilities
- Comcare – Air Conditioning and Thermal Comfort in Australian Public Service Offices

7 Program Evaluation

In order to ensure that these guidelines continue to be effective and applicable to the University, the program will be reviewed regularly by the WHS Unit and relevant stakeholders. Conditions which might warrant a review of the guidelines on a more frequent basis would include:

- an injury or near miss resulting from exposure to hot or cold environments
- incidents related to thermal comfort

- changes to Codes of Practice
- worker or Employer concern.

Following completion of any review, the program will be revised and, if necessary, updated in order to correct any deficiencies.

8 Version Control Table

Version Control	Date Released	Approved By	Amendment
1	061101	Manager WHS	Document created, incorporating 'OHS049 University Outdoor Staff Working in Wet Weather'.
2	100120	Manager WHS	Document reviewed and updated.
3	August 2010	Manager WHS	Document updated to incorporate the Personnel name change to Human Resources Division.
4	March 2012	Manager WHS	Re-brand.
5	December 2012	Manager WHS	Document updated to reflect the changes in legislation and the unit name change to WHS Unit.
6	July 2016	Manager WHS	Updated all content