

B6 - Thermal stress

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, administration/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and, where applicable, for post closure management. It addresses both workplace heat stress and cold stress. It covers high temperature conditions generated by the industrial process or the mining environment, temperatures exacerbated by hot weather, and extreme cold weather conditions, that can pose a risk to health and safety of employees and contractors.

2 Programme design

- 2.1 Hot areas or activities where employees have experienced or could experience excessive fatigue, muscle cramp, dehydration, dizziness and other symptoms of heat stress must be identified and described.
- 2.2 Where a risk of thermal stress is determined, a competent person must conduct monitoring surveys on site, in consultation with workers.
- 2.3 For defined extreme thermal conditions and job activities, medical examinations must include information about the

- operator's physiological and biomedical aspects, and an assessment of fitness for the working conditions.
- 2.4 Cold areas or activities where employees have experienced or could experience pain or loss of feeling in extremities, frostbite, severe shivering, excessive fatigue and other symptoms of cold stress must be identified and described.
- 2.5 Workplace thermal stress levels (temperature, air movement, humidity, etc), activities (work level, etc) and conditions (clothing, health, etc) that have the potential to exacerbate thermal stress effects must be adequately characterised and described. Workplace exposure assessment must be repeated according to regulatory requirements or whenever there is a change in production, work organisation, process or equipment which may impact thermal stress levels.

3 Measurement techniques

- 3.1 Detailed heat stress assessment of identified tasks or jobs must be tiered to:
- a) commence with the use of a simple heat stress index as a screening tool; then, if necessary;
 - b) use rational heat stress indices in an iterative manner to determine the 'best' control methods for alleviating potential heat stress; then

- c) undertake physiological monitoring when exposure times are calculated to be less than 30 minutes, or where high level PPE that limits heat loss must be worn.
- 3.2 Detailed cold stress assessment of identified tasks or jobs must be conducted according to current appropriate guidelines that incorporate a cold stress index, to determine the 'best' control methods for alleviating potential cold stress.

4 Exposure controls & treatment

- 4.1 Deleted.
- 4.2 When a risk of thermal stress is identified, the following exposure controls must be implemented:
- a) an acclimatisation period for new workers and those returning from extended leave or sickness;
 - b) training in the recognition of signs and symptoms of heat or cold stress, emergency procedures and preventative measures;
 - c) protective observation (buddy system or supervision); and
 - d) a requirement for self-paced working.
- 4.3 The following exposure controls must be considered by a competent person:
- a) work/rest regimes and job rotation based on measurements conducted;

- b) suitable rest areas with a provision of cool drinking water and cool conditions for high temperatures, or provision of warm drinks and warm conditions for cold temperatures;
- c) selection of appropriate clothing or other PPE for extreme temperature conditions;
- d) the use of engineering controls; and
- e) undertake hot/cold tasks during a cooler/warmer time of the day.

4.4 Where thermal stress is assessed to be a risk, the operation must develop a suitable emergency response plan.

Revision history

Version no.	Effective date	Prepared by	Authorised by	
1	Feb 2003	Richard Gaunt & Ian Firth	ExCo	
Version no.	Revision date	Revised by	Authorised by	Reason for change
4	December 2008	Ian Firth; Adrian van Tonder	Manoel Arruda	Incorporation of suggested changes from operations and alignment with HSEQ management system.