WHITEPAPER

COOLING THE LEGAL HEAT OF WORK, HEALTH AND SAFETY NON-COMPLIANCE

Reducing risks of heat stress for Australian workplaces

SAFE WORKPLACES

Australia is enjoying a 3.5% unemployment rate in 2023[i], continuing a downward trend since July 2020. 14 million Australians regularly leave their homes to work. They may perform different functions but one thing that these employees have in common is their expectation that when they leave their homes to go to work, they will be kept safe.

Workers' compensation claims tell another story. In the 10 years to 2019, there were 1,774 workers' compensation claims resulting from working in heat[ii], and while the claims are concerning further statistics paint a graver picture. In the 9 years to 2014, 13 employees died in Australia from environmental heat—including 5 from Queensland, one being a 40-year-old[iii].

Heat stress is a risk for the employee, the company employing them, and the individuals within the company managing them. Both the company and the individual working in a supervisory role (a Person Conducting a Business or Undertaking [PBCU] - anyone in a supervisory role such as a director, manager, or senior officer) have a responsibility to mitigate heat stress. This isn't just an ethical requirement; it is a legal requirement and the legal liability faced by individual managers personally is not widely known.

How cool a workplace is kept and how comfortable employees are at work can have multiple impacts on productivity, health, and legally on the individual company representative as well as the company through Workplace, Health and Safety (WHS) regulations.

WHAT IS HEAT STRESS?

When the workplace temperature is high and an employee is unable to keep their body temperature to its ideal range of 36-37 degrees Celsius, then heat stress occurs. Workplace temperature can be impacted by the air, radiant heat, air movement and speed, relative humidity, clothing worn, and physical assertion required in the job. These elements can impact comfort.

Heat stress can place physical strain on the employee including dehydration, cramps, rashes, heat exhaustion (sweating, weakness, fatigue, dizziness, nausea, headache), and heat stroke (confusion, loss of coordination, seizures, coma and possibly death). Little known effects of heat include increased chemical uptake in the body. Heat can impact how the body absorbs chemicals and can increase the side effects of some medications[iv].

The consequences of heat stress aren't just physical, the consequences for the company and the individual working in a supervisory capacity are legal.

WHAT IS REASONABLY PRACTICABLE WHEN IT COMES TO HEAT SAFETY?

Workplace Health and Safety (WHS) regulations within all states and territories mandate that:

1. "Ventilation must allow workers to carry out work without risks to health and safety
2. Workers carrying out work in extremes of heat or cold must be able to carry out work without risks to their health and safety" [viii]

Safe Work Australia recommends the following approaches:

- "Substitute the hazard with something safer
- Isolate the hazard, and
- Use engineering control measures." [ix]

If these approaches do not eliminate the risk, administrative control measures need to be implemented.[x] These may include cancelling tasks, waiting for hot conditions to pass, or using automated equipment.[xi]

BEAT THE HEAT-MANAGING THE RISKS OF WORKING IN HEAT

Anyone conducting a business or undertaking (PCBU) has a duty of care to ensure the health and safety of their employees while at work.[v]

Mandated heat safety regulations fall within the Workplace Health and Safety laws in the various jurisdictions within Australia. While there may be slight variations, the underlying principle is that workplaces (the company and the individuals that work in a supervisory role) must show they are managing risks to health and safety by eliminating or minimising risks as reasonably practicable.

To assess if heat is a hazard within the workplace and requires mitigation, Safe Work Australia recommends considering:

- "Air temperature
- Air flow
- Humidity
- Radiant heat sources
- Work requirements
- The workers, and
- The workplace." [vi]

Consideration should involve consultation with the employees as well as with businesses similar in nature to find out if heat is a hazard that is mitigated within a business's industry.

Review of "near misses, incidents, and injury records" will further help to identify risks.[vii]

Important to note, is the welfare of employees who are on performance-based salaries because they generally are less likely to take voluntary breaks or reduce speed in extreme heat, making them more prone to heat stress.

HOW TO MANAGE HEAT STRESS - PRACTICAL TIPS

Employees can expect that the following measures be implemented to mitigate heat stress, according to Australian Unions:

- Avoiding exposure to heat as much as possible
- Providing air-conditioned rest areas
- Changing the pace employees are expected to work at
- Amending work expectations during times of high temperatures
- Using air-circulating fans (such as Big Ass Fans)
- Using shade cloths or other shade structures including natural shade provision such as trees
- Providing access to cool drinking water
- Increasing rest breaks and cool drinks in the absence of air-conditioning and fans [xii]

Safe Work Australia further recommends:

- Considering waiting for cooler conditions
- Using automated equipment in hot conditions
- Using physical barriers (cones, fencing, barriers, guards, shields) so that people are not near hot machinery
- Removing hot air and steam using local exhaust ventilation
- Modifying dress codes and personal protective equipment (PPE)
- Implementing administrative controls such as amended work procedures where heavy physical work is carried out during cooler times of the day and training on managing heat stress, as well as adequate information and supervision [xiii]

Employees may have heat considerations included in their workplace agreements that stipulate the temperatures that trigger action by an employer.

Other employees can expect action, even when temperature thresholds are not stipulated within employment contracts and conditions.

BREAK GUIDELINES FOR THESE WORKPLACES [xiv]

For parts of the country that are normally cooler due to variable climate many workers are not acclimatised.

30 - 32 DEGREE CELSIUS	10 minutes rest every hour
32 - 35 DEGREE CELSIUS	15 minutes rest every hour
35 - 38 DEGREE CELSIUS	30 minutes rest every hour
OVER 38 DEGREE CELSIUS	Rest in a ventilated area until less than 38 degrees Celsius or go home

For hotter parts of the country

ABOVE 36 DEGREE CELSIUS	10 minutes rest every hour
ABOVE 38 DEGREE CELSIUS	15 minutes rest every hour
ABOVE 40 DEGREE CELSIUS	30 minutes rest every hour
OVER 42 DEGREE CELSIUS	45 minutes break every hour and no more than 2 hours at this tempperature

RAMIFICATIONS OF IGNORING HEAT

If you, as an individual working in a supervisory role, do not do everything that is reasonably practicable to mitigate heat stress and the business you work for also doesn't take steps to minimise heat stress then you might experience consequences in the following 3 areas:

- Financial
- Legal
- Reputational

Productivity decrease (up to 31%) is a financial consequence of any business ignoring heat stress risk.

Temperature vs productivity loss, based on research from the Helsinki University of Technology, Finland.

TEMPERATURE	PRODUCTIVITY LOSS
25.5°C	0.0%
26.6°C	-3.2%
29.4°C	-8.8%
32.2°C	-14.3%
35.0°C	-19.9%
37.7°C	-25.4%
40.5°C	-31.0%

Legal ramifications come in the form of Workplace Health and Safety non-compliance fines (including on-the-spot fines) and jail time for individuals working in the managing or directing role, as well as the business. [xv, xvi, xvii]

Non-compliance of Workplace Health and Safety regulations (not specific to heat stress) are attracting increasing penalties. In 2020, a Queensland director was jailed and fined $1 million for "reckless conduct in the workplace". [xviii]

In a 2022 case both a director and the company they worked for were prosecuted for non-compliance - the company fined $300,000 and the director jailed for 4 months. In that case, both were found to fail to comply with their safety duties, and without reasonable excuse, engaged in conduct that resulted in non-compliance. [xix]

Individuals need to take due diligence by doing the following:

- Being informed of health and safety issues
- Understanding the hazards and risks that employees encounter doing their jobs
- Ensuring elimination or mitigation resources and processes are in place
- Implementing procedures to receive information about hazards and risks, as well as incidents, and responding in a timely manner
- Maintaining WHS compliance with up-to-date safety information incorporated in the workplace
- Verifying all of the above is provided and used in the workplace. [xx]

Financial and legal consequences of WHS regulation non-compliance are up to $3 million in fines and 20-years' imprisonment. [xxi]

HYPOTHETICAL EXAMPLE

An employee in a Queensland workshop is taking stock from shelves at the end of an aisle that has no cross-breeze from the open doors at the other end of the workshop. Because of stocktake, the employee has felt pressure to work through their scheduled break, and they forgot to take water with them down the aisle. They feel the effects of heat stress, faint, hit their head and end up needing to be taken to hospital.

In this scenario, you could be at risk of WHS regulation non-compliance (Category 3). The business could face up to $500,000 fine and you, as the employee's manager, could be fined up to $100,000. [xxii]

INDUSTRY LEADERS TAKING CHARGE

Heat stress is a considerable problem for any business especially with the serious consequences of not mitigating heat or safeguarding employees against the effects of heat stress. A business aware of the implications of heat stress is Hastings Deering.

Hastings Deering supplies heavy vehicle parts and support for customers across industries such as mining, transport, construction, and agriculture. With more than 3,000 employees Hastings understands the benefits of keeping a workforce comfortable as well as safe - the company's many facilities are mostly based in hot climates (averaging above 30 degrees Celsius for 5% of the year, with humidity sitting above 70% for more than half the year) making working conditions challenging. Mitigating against heat stress for the safety of employees emerged as a key priority for Hastings and the company embarked on the HEAT project in 2021 to understand the options and best solution for their business. The HEAT project was trialled in 2 Hastings facilities—Mackay and Rockhampton—with the successful product to be incorporated into all Hastings Deering sites.

MACKAY SITE

The first pilot site was a workshop in Mackay - a north Queensland city that experiences an ambient temperature above 30 degrees Celsius for 5% of the year and relative humidity (RH) above 70% for more than half of the year. RH range for health and safety should be maintained at 40-70% making the climate conditions in Mackay a key consideration in Hastings's health and safety focus. The workshop experienced hot spots from lack of air movement.

ROCKHAMPTON SITE

The Hastings Rockhampton workshop - in another north Queensland city that experiences ambient temperature above 30 degrees Celsius for 7% of the year and RH above 70% for 26% of the year - also experienced heat spots especially in areas with direct sun exposure and lack of air movement.

BOTH SITES

Across both sites, while there was adequate cross ventilation in general, the working areas, where employees spent most of their time, experienced very limited air movement. Stagnant air flow resulted in employee complaints that temperature build-up from lack of air movement made summer uncomfortable, with the extreme heat necessitating work breaks. Complaints across both sites detailed how employees found it difficult to work, needed longer breaks, and needed to rest more frequently, slowing work progress.

SOLUTION CONSIDERATIONS

Taking advice from engineering firm, JHA Services, Hastings found that the only way they could cool their employees and decrease the effects of humidity felt in the workshop was through a cooling system.

Considerations for the cooling system included the workshops already possessing:

- Thermal insulation on most walls and roofs
- Openings for cross ventilation
- Typical ridge-type roof ventilation openings on several buildings.

Both pilot sites had circa 40 employees in the workshop space.

JHA Services tested 3 cooling systems:

1. Overhead fans
2. Air-conditioning
3. Evaporative cooling

HASTINGS DEERING EMPLOYEES SPEAK

Caleb Fatnowna - Facility Worker: ***"I wish we had these fans installed years ago"***.

James Eydems - Facility Worker: ***"You can really feel the difference in the work environment when they are on"***.

Andrew Sutton - Facility Worker: ***"Having the fans on in the workshop makes my workday easier"***.

FINDINGS

Key findings of the engineering audit:

- Workshops did not have sufficient openings for cross ventilation to make any impact on the temperature
- Workshops lacked complete roof insulation creating an oven-effect

Key recommendations:

1. Increasing air movement / speed in the space

   This is found to often increase evaporative cooling delivering a perceived cooling effect (even though the temperature does not change). Indeed, air movement and speed would lower the perceived temperature by upwards of 6 degrees Celsius compared to the original temperature.

2. Air conditioning is not viable in the space due to the large warehouse openings and goods entering and receiving.

   Targeted cooling of workshop areas could not be achieved with an air conditioning system.

3. Evaporative coolers are not as effective in tropical, high-humidity environments such as those experienced in Mackay and Rockhampton.

   Humidity negates the cooling effective of evaporative coolers.

PILOT SITE FINDINGS

Using Big Ass Fans, the workshops felt 6 degrees Celsius cooler compared to the perceived temperature prior to the fans.

Big Ass Fans were an instant success in improving work conditions for Hastings employees and the positive reception of the fans in the pilot sites signals the successful incorporation of the fans across other Hastings Deering sites. To date, installation has occurred in Mackay, Rockhampton, Darwin, and Townsville with more on the way.

Hastings Deering Construction Project Manager - Facilities, Paul Kolb, said the fans helped make the working day for the workshop teams a lot easier.

"The fans have been an instant success in improving work conditions for Hastings Deering employees.

"Employees are happier, taking less breaks, and most importantly, as a business we are providing a safe environment for our employees to work in, so they can return home safely every day."

BAF AND HOW THEY HELP

Heat Stress is something to take seriously. Ignoring Heat Stress and its impact on your employees could mean failure to comply with WHS regulation and serious financial and legal consequences for both the company, but also the individuals involved.

Let our Airflow Experts do an airflow analysis and help you develop a custom solution for your facility. Visit www.bigassfans.com/au for more information.

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