



MĀKUSAFE: A COMPREHENSIVE SOLUTION IN PREVENTING HEAT ILLNESS AND INJURY

Heat-related illness and injury pose significant risks for workers, especially in industries where physically demanding tasks, outdoor work, or confined spaces are common.

As environmental conditions become more extreme due to climate change, safety managers must be prepared to address the challenges posed by excessive heat. Traditional methods of monitoring workplace conditions, such as fixed sensors and periodic checks, are often inadequate. MākuSafe's wearable technology offers a comprehensive, proactive solution by continuously monitoring not just heat and humidity but a variety of other environmental conditions and physical stress factors. This enables a more dynamic and holistic approach to protecting workers and preventing heat-related incidents.

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REAL-TIME HEAT INDEX MONITORING FOR INDIVIDUAL WORKERS

At its core, MakuSafe's wearable device excels in real-time monitoring of environmental conditions such as temperature, humidity, and pressure (TPH), which are critical in calculating the heat index—a measure of how hot it feels when humidity is taken into consideration in addition to temperature. Heat stress can cause serious health issues like heat exhaustion, heat stroke, and even death. MakuSafe wearables gather TPH data in real time and transmit it to the MakuSmart platform, which calculates a personalized heat index for each worker. This ensures that safety managers have continuous, individualized data that allows them to proactively address dangerous heat exposure conditions.

Unlike biometric monitoring, which only reacts to heat stress after it has begun affecting a worker's body, MakuSafe's environmental monitoring alerts safety managers when conditions are approaching dangerous thresholds—before heat stress occurs.

This enables safety teams to take preventive measures, such as rotating workers or implementing cooling solutions, rather than responding reactively once symptoms appear. By focusing on the environment rather than personal biometrics, MakuSafe preserves concern for privacy and provides a non-invasive way to safeguard workers' health.

Comprehensive Data Collection Beyond Heat

MākuSafe's wearables do more than just monitor heat and humidity—they also gather data on other environmental hazards such as air quality, noise levels, and lighting. These additional data points provide crucial context for understanding the complete range of risks workers face in a given environment. For instance, poor air quality can exacerbate heat stress by making it harder for workers to cool down through respiration, especially if they are wearing PPE such as masks. Similarly, high noise environments and low light levels may contribute to fatigue, and may prevent workers from recognizing early symptoms of heat exhaustion.

By combining all of these environmental factors with heat monitoring, MākuSafe provides a more comprehensive understanding of the risks that might contribute to heat illness. This allows safety managers to develop more effective risk mitigation strategies. Traditional biometric devices that monitor only heart rate or core temperature can miss these critical environmental triggers, while MākuSafe's approach captures the full scope of potential hazards.



Monitoring Worker Physicality and Strain

A significant differentiator of MākuSafe's technology is its ability to track the physical exertion and movements of workers in real time. The wearable device monitors high-force, accelerated movements and the overall physical effort expended by workers throughout their shifts. Physical exertion is a primary contributor to heat stress, especially in physically demanding industries such as construction or manufacturing. Workers engaged in heavy manual labor are at much higher risk of heat illness, even in moderate temperatures.

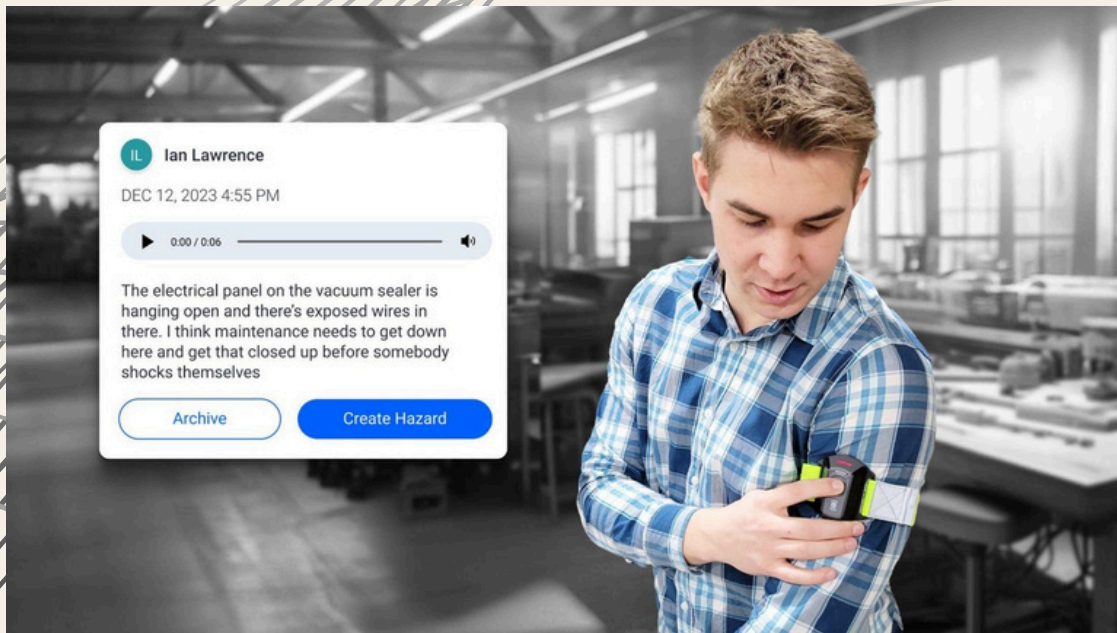
MākuSafe's ability to monitor physical strain allows safety teams to assess not just the environmental conditions, but also how much exertion each worker is experiencing. This is a critical advantage over biometric sensors, which may only detect heat stress once a worker's physical condition has already been affected. By tracking physical effort in conjunction with ambient heat, safety managers can adjust workloads or implement breaks to reduce the likelihood of heat-related incidents.



Addressing Acclimatization: The Role of Individualized Monitoring

One of the most overlooked yet critical factors in preventing heat illness is ensuring proper acclimatization. Workers who are new to a high-heat environment or who have not been consistently exposed to heat over time are at significantly greater risk of heat-related illnesses. According to OSHA, most heat-related fatalities occur in the first few days of exposure to a hot work environment, as the human body needs time to build a tolerance to heat. This process of heat acclimatization is essential for maintaining safety, yet it can be difficult for safety managers to track manually.

MākuSafe's wearables offer an ideal solution by allowing safety leaders to monitor individual acclimatization in real time. For new workers or those who have not yet developed a tolerance to heat, the system can aid leaders in closely monitoring individuals for signs of elevated conditions or exposure earlier than their acclimatized counterparts. This individualized data allows safety leaders to take proactive steps, such as providing extra hydration, mandating shorter shifts, or closely supervising high-risk individuals during their first few days on the job. By continuously tracking heat exposure and physical strain for each worker, MākuSafe helps ensure that acclimatization is managed effectively and that workers who are at greater risk are given the extra attention they need to avoid heat illness.



Push-to-Talk Communication for Immediate Action

MākuSafe wearables also include a push-to-talk communication feature called MyVoice, which allows workers to report concerns or request help in real time given reliable connectivity. In the context of heat stress, this can be life-saving. Workers who experience symptoms of heat exhaustion - such as dizziness, confusion, or muscle cramps - can instantly communicate with safety managers and request assistance before their condition worsens. This feature also allows workers to report environmental hazards, such as broken cooling systems or areas of high heat, further enhancing the effectiveness of workplace safety management. MyVoice messages are delivered to leadership within seconds as playable audio recordings and transcriptions.

Dynamic, Facility-Wide Insights from Mobile Sensors

Unlike traditional fixed environmental sensors, MākuSafe’s wearable devices act as mobile sensors, moving with workers throughout a facility. This provides continuous, real-time data from every corner of the workplace, allowing safety managers to identify hot spots or areas where environmental conditions are consistently hazardous. Traditional fixed monitors only offer a static snapshot of conditions in specific locations, which may not accurately reflect the risks workers face as they move through different zones.

The ability to collect data from multiple moving sensors provides a dynamic, real-time map of environmental conditions, enabling more precise safety interventions. For example, data from a consensus of wearable devices might reveal that a certain area of the facility consistently experiences high heat during certain times of day, prompting safety managers to adjust work schedules or install additional cooling equipment.

Privacy and Worker Trust

MākuSafe’s approach to heat safety management respects worker privacy by avoiding the collection of personal biometric data. Unlike biometric sensors that track sensitive health information, MākuSafe wearables focus solely on environmental conditions and physical activity. This not only protects workers’ privacy but also fosters greater trust and acceptance of the technology. Workers are more likely to adopt wearables that monitor their surroundings rather than invasive devices that track their personal health metrics.

This conscious approach aids leaders in introducing wearable tech successfully and communicating concern for privacy. This is especially important in industries with diverse workforces, where data privacy concerns may otherwise prevent the widespread adoption of monitoring technologies.

Regulatory Compliance and Future-Proofing

MākuSafe’s solution is also ideal for ensuring compliance with regulatory standards, particularly in regions like California, where OSHA's new indoor heat standard mandates stricter heat safety measures. The requirement in California now includes monitoring temperature and heat index throughout facilities where indoor work is done. Time and date stamped records by work area as shown below will contribute to evidence based decision making regarding worker health. As similar regulations are expected to be adopted in other states, the ability to monitor individual heat exposure and physical exertion in real time will become increasingly essential for compliance and worker safety.



MäkuSafe's comprehensive data collection capabilities make it easier for organizations to meet these regulations, providing the documentation and real-time evidence needed to ensure that heat-related risks are being actively managed. By offering proactive, dynamic monitoring, MäkuSafe not only helps organizations stay compliant but also protects workers from the risks of heat illness and injury.

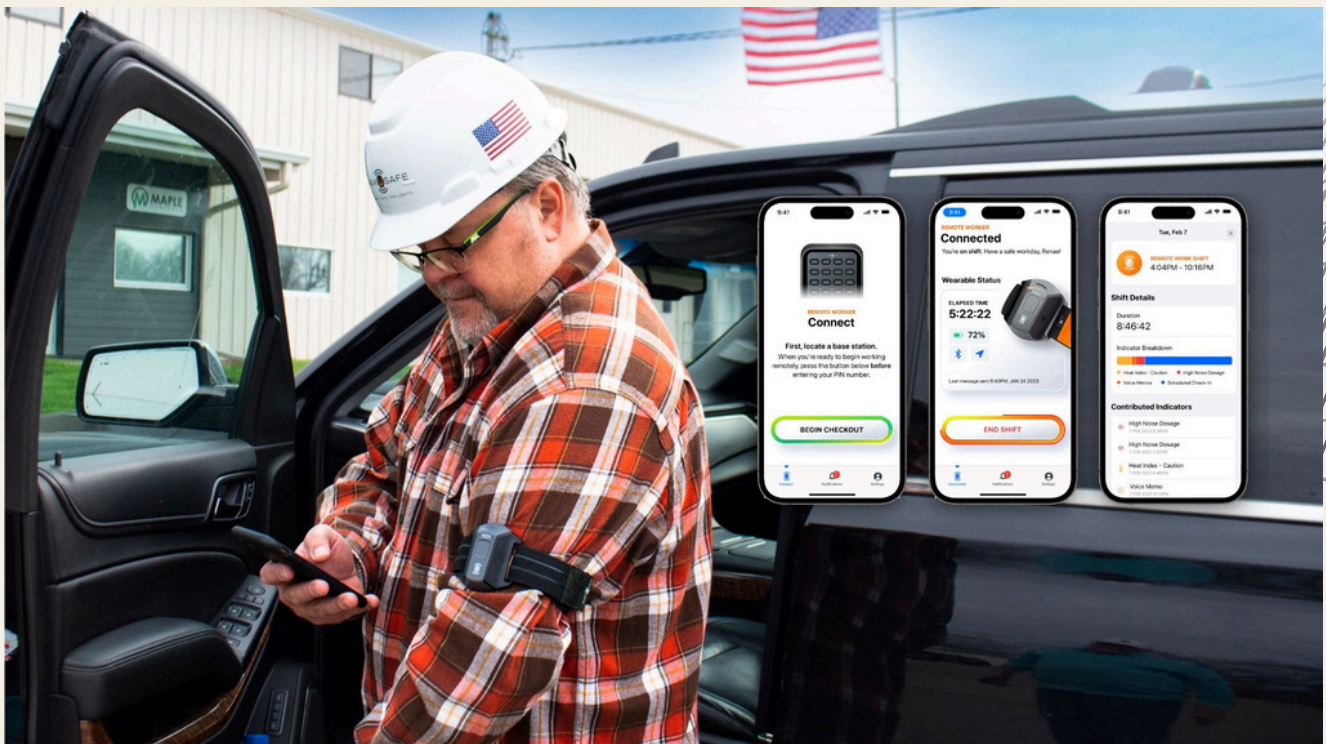
Practicality and Cost-Effectiveness

MäkuSafe wearables offer an affordable and practical solution for businesses looking to improve heat illness prevention and overall workplace safety. Unlike traditional environmental monitoring systems that require extensive infrastructure and installation, MäkuSafe's devices are lightweight, easy to deploy, and cost-effective. Each worker becomes a mobile sensor, eliminating the need for multiple fixed monitoring stations and reducing the reliance on periodic environmental audits that can miss emerging hazards.

Additionally, MäkuSafe's data analytics platform, MäkuSmart, aggregates the information collected from all workers, providing safety managers with actionable insights without the need for extensive manual data processing. This streamlined approach allows for quick, data-driven decisions that enhance safety while reducing costs associated with workplace injuries, heat-related illnesses, and regulatory non-compliance.

Remote Worker App

The MäkuSafe Ally wearable device can also be used with remote workers, who spend their day outside of the facility. Ideal for field staff or route drivers, these workers are able to pair their wearable with a company issued mobile device at the beginning of their shift via a native app for iOS or Android. In cellular covered areas, the wearable will send health and safety data in real-time that is GPS location enriched. As one safety director put it, "I know exactly what my drivers are experiencing in the truck, it's what they experience outside the vehicle that I want to know because we have little control over it."



In conclusion, MäkuSafe's wearable technology offers a comprehensive, real-time solution for preventing heat illness and injury, with several key advantages over traditional biometric monitoring systems. By focusing on environmental conditions, physical exertion, and non-invasive monitoring, MäkuSafe provides a holistic approach to worker safety. Its ability to gather real-time data from mobile sensors, combined with features like push-to-talk communication and individualized monitoring, ensures that safety managers can proactively address heat risks before they escalate into serious incidents.

With its emphasis on privacy, scalability, and regulatory compliance, MäkuSafe's technology is not only future-proof but also an essential tool for organizations committed to protecting their workers from heat-related hazards. In industries where heat stress is a persistent threat, MäkuSafe provides a dynamic, scalable, and effective solution for safeguarding worker health and improving overall safety management.

About the Author: Tom West is Vice President & Global Practice Leader at MäkuSafe, a SHRM & HRCI Senior Certified HR Professional, and a Certified Occupational Safety Specialist. With extensive executive leadership experience throughout his career, Tom has led various companies in the learning & development, and technology spaces. He also served as a College Professor for nearly 30 years, shaping future leaders in management. An Avetta Fellow and member of the National Speakers Association, Tom is active in organizations such as AIHA, NSC, ASSP, and VPPPA. He co-authored the upcoming book *Safety and Wearable Technology: Impact, Applications and Implementation in Industry* (available from CRC Press, Spring 2025).



About MäkuSafe: MäkuSafe is an award-winning solution that combines wearable technology with powerful safety data analytics. The MäkuSafe ecosystem features an armband-worn wearable, the AI-powered MäkuSmart data platform, and flexible integration modules called Interact. This system delivers real-time insights that help boost productivity, reduce workplace incidents, lower claims, and cut costs. From a safety management perspective, MäkuSafe captures data on environmental hazards, slips/trips/falls, ergonomic risks from strain and exertion, and voice-reported good catches, offering a comprehensive view of workplace safety risks. This data enables manufacturers, construction, and industrial organizations to spot trends, take proactive steps, and prevent hazards, ensuring worker safety. In advanced manufacturing, MäkuSafe Interact helps integrate connected workers into automated environments, contributing to Industry 4.0 and digital transformation by providing location proximity data and enhancing smart factory operations.



The Ally™ gathers & transmits data in real-time to the MäkuSmart Cloud

Motion Detection

- Slips, Trips, and Falls
- Repetitive Motions
- Worker Physicality
- Forceful Exertion

Battery

- 22 Hour Battery
- Multiple Shifts

MyVoice™

- Audio Messaging
- Voice-to-text
- Push-to-talk

Spatial Awareness

- Location Identification
- Worker-to-worker Proximity
- Access Control & Factory 4.0
- Contact Tracing

Environmental Sensors

- Ambient Light
- Air Quality (TVOC & CO2)
- Noise / Sound Dosage
- Air Pressure
- Humidity
- Temperature

A Sensor-Packed Data-Gathering Ally™

MÄKUSAFE