

ULTRA DEEP MINING NETWORK

The business of mining deep: below 2.5 km



UDMN
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Thermal Garment

OBJECTIVE:

Developing adaptive wearable mining technology to normalize the environmental conditions in which workers are asked to perform their job duties.

CHALLENGES:

Extreme heat accompanied by intolerable humidity and increased pressure in conjunction with greater transportation and communication distances are redefining the rules of deep mining. This new environment is forcing the mining community to rethink and reevaluate personal protective equipment standards, communication, and navigation protocols. The review of these general industry-mining practices is forcing a step-change for mining at depth.

Furthermore, the mining industry's aging workforce is physiologically more susceptible to heat stress than its younger cohort creating an even greater urgency. Development of technologies that will both monitor and reduce the risk due to heat strain is essential and crucial for mining at depth.

APPROACH:

The Thermal Garment is meant to support proactive biofeedback monitoring of the workforce and facilitate early detection of employee health conditions in addition to decreasing the risks of heat strain or other physiological condition that are triggered by severe environmental conditions.

Depth and the individual health of each worker may require different prevention parameters or procedures in order to mitigate, subside, and reduce acute or chronic situations. The proper detection and diagnostic of someone's own vital signs are instrumental in reducing critical injuries before they occur. These portable technologies will enhance, augment, and facilitate cooling of the body in order decrease the risk of heat strain. Research and thermophysiology studies are being conducted to develop a non-invasive estimator of risk from heat strain.

BENEFITS:

Helping the body adjust and stabilize itself within a variable working environment is the key to normalizing the core temperature. Pairing the human body with smart clothing and communication equipment is the best solution to safely mining below 2.5km. Adapting to this new deeper environment and its conditions will ensure earlier and safer access for drilling, mine development, and overall value. Greater adaptation and heat tolerance will invariably reduce the costs of chronic and acute injuries or illness and indirectly lower the overall mining costs associated with human injury, inherently increasing the value of the mined mineral reserves under foot.

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