

Mining Workers Safety Jacket

REQUIREMENT DOCUMENTATION

Category	Requirement	Stakeholder	Acceptance Criteria
Functional Requirements	Hazard Detection	Mining Workers	The safety jacket must incorporate sensors to detect hazardous conditions such as gas leaks, temperature extremes, and physical impact
Functional Requirements	Real-Time Alerting	Mining Workers	The system should promptly alert the wearer in real-time upon detecting potential hazards or abnormalities in environmental conditions.
Functional Requirements	GPS Tracking	Supervisors	The safety jacket must include GPS tracking functionality to monitor the location of workers within the mining site for safety and rescue purposes.
Functional Requirements	Communication module	Supervisors	The jacket must be equipped with a communication module to facilitate data transmission between the jacket and a central monitoring system for supervision and response.
Functional Requirements	Emergency Response Mechanism	Mining Workers	The safety jacket should feature an emergency response mechanism that allows workers to quickly signal for help or alert supervisors in case of emergencies.

Non-Functional Requirements	Durability	Mining Workers	The safety jacket must be constructed from durable materials capable of withstanding the harsh conditions and physical demands of mining environments
Non-Functional Requirements	Comfort and Wearability	Mining Workers	The design of the safety jacket should prioritize comfort and ergonomic fit to ensure ease of movement and wearability during extended shifts.
Non-Functional Requirements	Battery Life	System Administrators	The jacket's battery should have a sufficient lifespan to support continuous operation throughout a typical mining work shift..
Non-Functional Requirements	Data Security	System Administrators	The communication between the safety jacket and central monitoring system must be secured with encryption protocols to prevent unauthorized access and data breaches.

Requirement Traceability Matrix:(Done Using Excel)

Associate ID	Requirement Description	Business Needs, Opportunities, Goals, Objectives	Project Objectives	W8 Deliverables	Product Design	Product Development	Test Cases
A001	Mining jacket to integrate IoT sensors for monitoring oxygen levels and other environmental factors	Improve miner safety by providing real-time environmental data	Ensure miner safety by monitoring environmental conditions in real-time	Mining jacket prototype with integrated IoT sensors	Design specifications for mining jacket with IoT sensors	Develop mining jacket prototype with integrated IoT sensors	Test integration of oxygen level sensor with mining jacket
A002	Implement IoT sensors for detecting hazardous gases in mining environments	Reduce the risk of gas-related accidents in mines	Implement gas detection sensors in the mining jacket	Mining jacket with integrated gas detection sensors	Design gas detection sensor integration into mining jacket	Integrate gas detection sensors into mining jacket	Test gas detection sensor accuracy and response time
A003	Integrate IoT sensors for tracking miner's location and movement inside the mine	Improve emergency response and rescue operations in case of accidents	Enable real-time tracking of miners' location and movement	Mining jacket with integrated GPS and motion sensors	Design GPS and motion sensor integration into mining jacket	Develop GPS and motion sensor integration into mining	Test accuracy and reliability of GPS and motion sensors
A004	Incorporate IoT sensors for monitoring vital signs of miners such as heart rate and body temperature	Ensure early detection of health issues and prevent accidents due to health-related problems	Enable continuous monitoring of miners' vital signs	Mining jacket with integrated vital sign monitoring sensors	Design integration of vital sign monitoring sensors into mining jacket	Develop integration of vital sign monitoring sensors into mining	Test accuracy and reliability of vital sign monitoring sensors
A005	Integrate IoT sensors for detecting structural weaknesses in the mine	Enhance mine safety by identifying potential hazards such as collapsing structures	Implement structural monitoring sensors in the mining environment	Mining jacket with integrated structural monitoring sensors	Design integration of structural monitoring sensors into mining jacket	Develop integration of structural monitoring sensors into mining	Test structural monitoring sensor effectiveness in detecting weaknesses
A006	Develop a user-friendly interface for miners to access data collected by IoT sensors	Facilitate easy access to real-time environmental and health data for miners	Create an intuitive interface for accessing sensor data	User interface for mining jacket sensor data	Design user interface for accessing sensor data	Develop user interface for accessing sensor data	Test usability and functionality of the user interface