**IOT BASED SMART MINE MONITORING SYSTEM**

**Introduction:**

Mining is one of the most dangerous trades all over the world. In some countries, underground miners lack safety, social guarantees and in case of injury may be left to cope without assistance. There are negative social impacts as well, such as displacement and lost livelihoods. The mining industry has the highest incidence of occupational deaths among all industries. Common causes of occupational deaths include rock falls, fires, explosions, methane intoxication, and electrocution. There are many case studies behind underground mines, a recent case study in china, reveal that underground mining in China is the world's deadliest industry. For this, RF technology is chosen for

the communication inside the mines.

**Key Views:**

Miners will make use of IoT primarily as a means of achieving cost and productivity optimisation, improving safety measures and developing their artificial intelligence needs.

Most current real-life examples of IoT use in mining focus on the use of sensors and mobile telemetry to gather data that allows companies to continuously monitor operations and improve overall efficiency.

A lack of inherent technical know-how and connectivity will continue to pose headwinds to the ongoing widespread adoption of IoT solutions by mining companies in key SSA, Latin American or Asian markets.

Other key challenges include cyber threats and a potential policy backlash from governments as technological advances in mining lead to a decline in the use of local workers and services, which will negatively impact government revenues.

**Existing Methods And Drawbacks:**

There are many existing techniques for the communication inside the underground mines.The communication schemes include GSM,RFID,Zigbee,Radar sensor network, etc.These techniques are used for the communication inside and outside the underground mines. By integration with other techniques, the efficiency of the selected method can be improved.

**GPS System:**

The Global Positioning System is the most probably used communication system for large coverage area. GPS Provides critical positioning to commercial users all over the world. The advantage of GPS is its long coverage area and the disadvantage is that it is less efficient for underground mines

**GSM Technology:**

The GSM communication technique also covers a large area. Even though it is used in underground mines, communication delay stands as a major disadvantage. Hence this technique is found to be less effective for a critical environment like underground mines.

**RFID Technology:**

The use of RFID technology is far better for positioning or localization of underground mine workers and the locomotive devices inside mines.Unlike IR, it does not need Line-of- Sight communication. Even though RFID is technically sound in tracking systems, it is found that the maintenance of RFID tags is a drawback.

**RADAR Technology:**

Radar sensor technology is more effective for underground mine measurement, which includes the measuring of environment parameters. The sensors are not much affected by the dust. It can penetrate into any type of harsh environment of dust and mist. But the main difficulty which makes it lagging is the high cost needed for the equipment’s and maintenance.

**ZIGBEE Technology:**

The Zigbee technology is widely used technique for underground communication. Even though it is a low power and user-friendly technique, its cost is more. Due to the widely usage, its cost is trying to be reduced nowadays.

**Proposed Method:**

The possibility of drastic change in the underground environment can lead to hazards to the miners working inside the mines. Hence there is minimum measure of safety provided. A better sensing system as well as localization in order to improve the safety of the mine personnel is developed. These can be realized by an appropriate communication scheme.

Radio frequency technology can be proposed to be a better communication scheme inside underground mines.In order to sense and measure the parameters inside the dynamically varying environment parameters Wireless sensors can also be introduced. Now the

integration of Radio frequency technology and wireless sensor network can improve the safety inside the mines. A real time localization system can be achieved via Radio frequency technology and a real time sensing system can be resulted via wireless sensor network at the meanwhile.