INESI

Increasing Efficiency and Safety Improvement in Underground Mining Transportation Routes

In this project, ultra-wideband radio technology was used to locate people and means of transport in underground mines. Stationary anchor modules were installed in the mine workings, e.g. in the ridge. The positions of the personnel were determined by the radio signal propagation time between the transmitting anchor modules and the mobile tags, which receive the radio signals. One goal of the project was to record the calculated positions in the 3D pit building of the persons and machines and then visualize them in the control room. Furthermore, events such as gas or water outbreaks or fires are to be detected and displayed by sensors in order to show the staff the safest way of evacuation.

Analogous to the localisation of personnel, the localisation of transport means such as monorails, overhead monorails or floor-mounted machines were carried out. The mobile tags required to receive the UWB radio signals were installed on the machines. The aim of the project was to use the calculated positions of the machines and the available information to create an intelligent route calculation for optimum loading and operating procedures.

Within the framework of the INESI project, a person detection system based on infrared thermography was also being developed at AMT, which was tested in two different underground mines and then integrated into the existing infrastructure system of the mine. The aim was to detect people in dangerous areas, e.g. in front of crushers or bunkers, in order to avoid accidents by automatically switching off the conveyor system.

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