BUSDUCT

Increase of mines efficiency and health protection through the innovative transport system based on BUSDUCT

Due to the increasing length of the transportation routes in existing underground coal mines, there is an economic need for faster transport vehicles to reduce the transportation times of material and personnel to the respective working areas. The BUSDUCT project aimed at meeting this demand with a prototype of a suspended monorail locomotive (SML) which is supplied with eletrical energy via a busduct.

To ensure that the prototype could be safely operated in the potentially explosive atmospheres of coal mines, inertisation was used as an explosion protection measure. The task of the Institute for Advanced Mining Technologies (AMT) was the monitoring of the inertisation process and the resulting conceptual design of a sensor system for the safe operation of the SML. Furthermore, the AMT developed a control system for the SML based on defined safety parameters.

The core elements of the sensor system were gas concentration-, pressure- and temperature sensors. Through the redundant use of the various sensors, a multi-layer safety system was to be set up to provide characteristic values for controlling the SML. Since a SML is a complex structure, the optimal position of the individual sensors was to be determined by means of a flow simulation.

The developed prototype was supposed to be tested according to the ATEX specifications and used in a test run with a duration of a half year in a Polish coal mine. However, due to difficulties in the consortium, the project was ended prematurely.

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