EgaRoh.PLING

Platform-based Integration and utilization of extraction data (PLING)

A secure and sustainable supply of raw materials is crucial for the German economy. However, the raw material supply is hampered by geopolitical uncertainties, growing demand and increasingly complex and heterogeneous deposits. Conventional mining planning, which is typically based on isolated exploration drilling, is reaching its limits because it does not offer the required accuracy and speed in adjusting the deposit models. In order to optimise decision-making, minimise environmental impact and comply with high safety standards, the extraction process must be designed dynamically. This requires continuous updating of the deposit model.

A flexible sensor platform developed as part of the EgaRoh.PLING project is used to continuously update the deposit model. Data is collected for geology, deposit quality, environmental monitoring, and on-site localisation using different sensor technologies. With the help of the collected data the raw material deposit is precisely evaluated, enabling selective and resource-efficient extraction.

The PLING system is being developed as part of a collaboration between TUBAF, RWTH Aachen University (AMT and MRE), Knauf Gips KG, Innomotics GmbH and associated partners Zinnwald Lithium GmbH and K+S Group. The PLING system is being demonstrated in three case studies:

- 'Hüttenheim' anhydrite mine (Knauf KG)
- ‘Werra’ potash mine (K+S)
- ‘Altenberg’ exploration tunnel (Zinnwald Lithium GmbH)

During the project, AMT is responsible for designing the sensor platform and selecting suitable sensors for the respective use cases, as well as for the subsequent collection and use of sensor data to optimise raw material extraction. When designing the carrier platform, suitable sensors will be selected that enable spatial localisation and collect required quality, geotechnical and environmental data. For this purpose, LiDAR, XRF-, radar and hyperspectral cameras, among others, will be integrated. On this basis, approaches for data-based production control will be developed. Based on the obtained geological data and the deposit model, an automated alignment of the drilling jumbo is strived to adapt the drilling process to the given deposit situation.

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