INNOVATIVE SOLUTIONS OF KOMAG INSTITUTE FOR MINING INDUSTRY

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INSTITUTE
OF MINING
TECHNOLOGY

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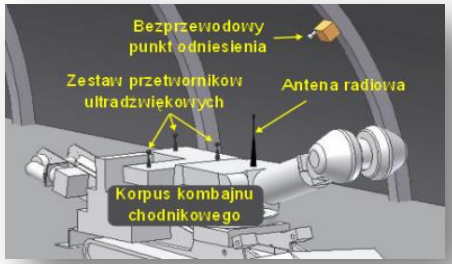
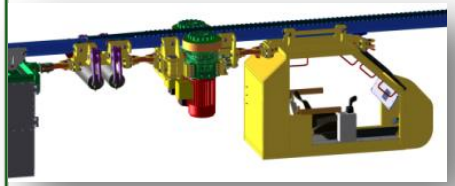
SCOPE OF ACTIVITY





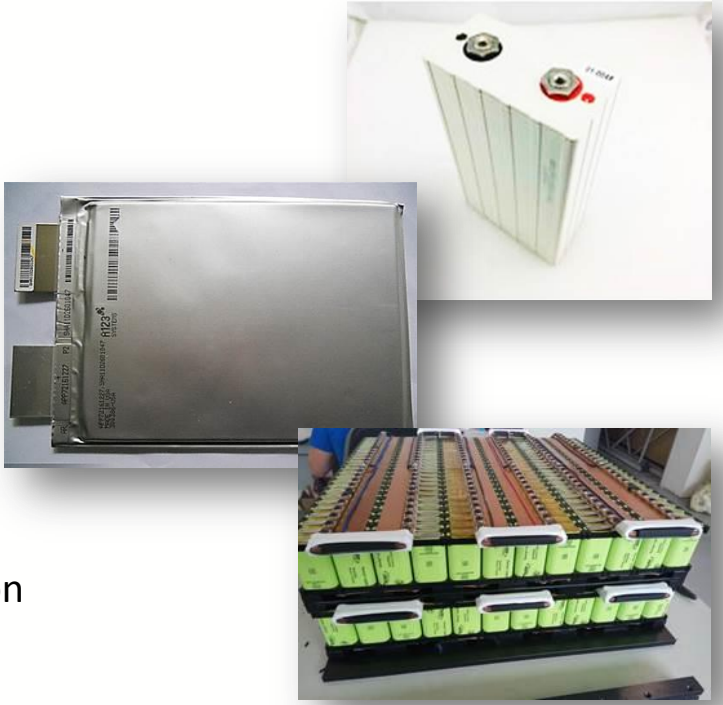
- Scientific, research and technical projects in the scope of intelligent mechatronic systems aiding the processes of minerals' production and beneficiation.
- Designing and implementing innovative and safe haulage systems in plants producing and processing minerals.
- Interactive shaping of work safety in the mining industry.
- Research and development projects in the domain of environmental engineering and material engineering.
- Development of research and testing methods oriented onto an improvement of work safety as well as a safety of using products.

e-MOBILITY IN MINING INDUSTRY

Innovative approach of the KOMAG Institute to mine battery drives - the first application in the world of lithium batteries in workings where an explosion hazard occurs.

Advantages:

- an improvement of safety and work conditions of mining teams due to:
  - an elimination of exhaust gases emissions to the mine atmosphere,
  - a significant reduction of noise and heat emission,
  - an elimination of electrolytic gases to the mine atmosphere,
- a reduction of exploitational costs of mobile mining machines,
- a possibility of energy recuperation (e.g. during braking),
- a possibility of charging batteries in any place (an elimination of necessity of constructing special chambers).



e-MOBILITY IN MINING INDUSTRY

Battery drives

GAD-1 Suspended Haulage Unit

PCA-1 Suspended Manoeuvring Haulage Unit

e-MOBILITY IN MINING INDUSTRY

Battery drives

WS-172 Blasting Vehicle

Advantages:

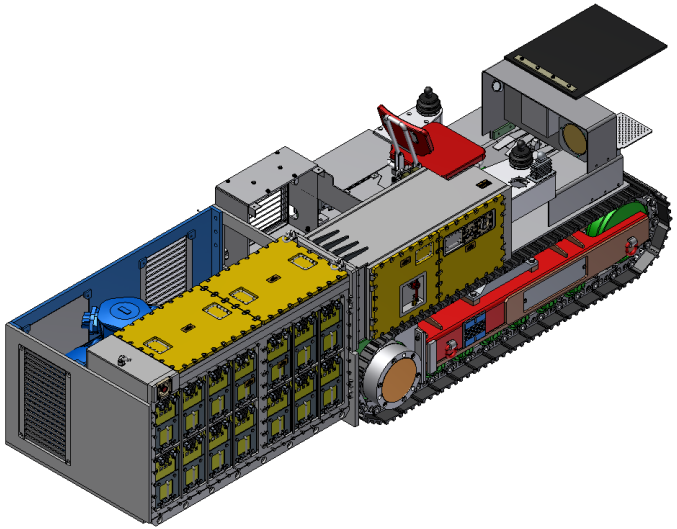
- a battery drive instead of the supply system from the mine network, used so far,
- a reduction by 2/3 of time indispensable for charging blasting holes with explosive material,
- an improvement of work safety and comfort.

Implementation:
KGHM Polska Miedź S.A., ZG Rudna Plant

e-MOBILITY IN MINING INDUSTRY

HYDKOM-75 **Innovative mobile machine with mineral electric drive system increasing technical safety level**

The project is aimed at an elaboration, manufacture, testing and an implementation to production of a floor-loader, supplied from lithium batteries, designed for an operation in “a”, “b” and “c” conditions of methane explosion hazard and “A” and “B” coal dust explosion hazard.

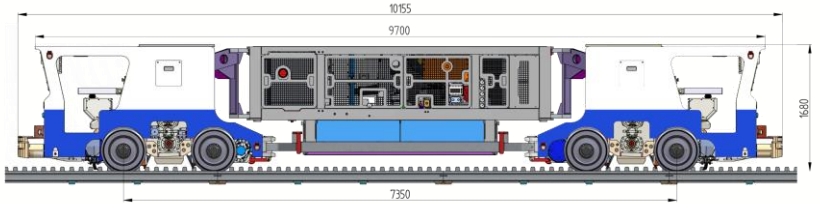


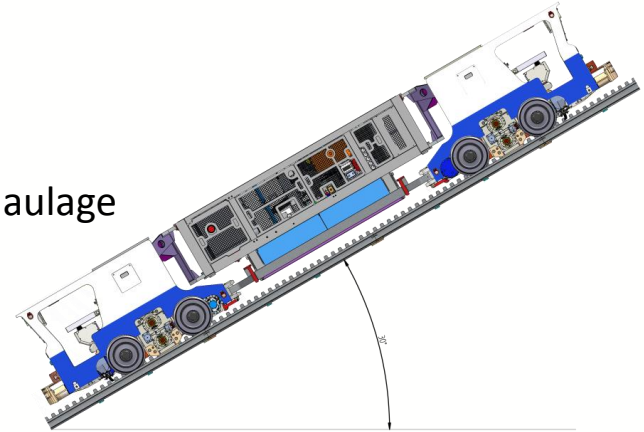
Period of realization: January 2017 – December 2019

Fundusze Europejskie Inteligentny Rozwój
Rzeczpospolita Polska
Narodowe Centrum Badań i Rozwoju
Unia Europejska Europejski Fundusz Rozwoju Regionalnego

e-MOBILITY IN MINING INDUSTRY

LZS-150 locomotive with rack drive function





Advantages:

- a combination of advantages of a locomotive and a floor rack haulage unit,
- a possibility of operation in horizontal and inclined (up to 30^0) workings,
- an elimination of reloading necessity of heavy machines and equipment from the shaft to the destination place,
- significant time savings and a reduced work effort during a realization of transportation activities.

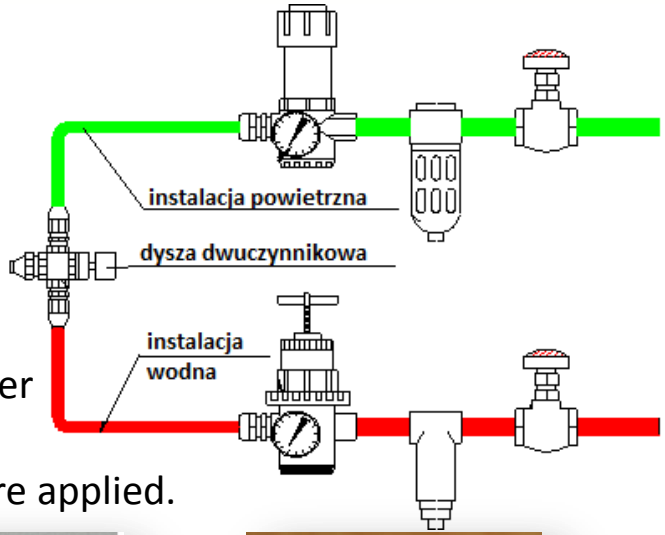
becker WARKOP SYSTEMY DLA GÓRNICTWA

IMPROVEMENT OF WORK SAFETY

A new approach of the KOMAG Institute to spraying issues – an application of air-and-water spraying systems.

Advantages:

- a higher dust reduction efficiency,
- a high efficiency of preventing against methane ignition (smothering of sparks),
- a high efficiency of extinguishing ignited gas,
- a reduction of water consumption (in relation to typical water spraying systems).



The following author's design solutions of two-agent nozzles are applied.


StK-2D


STK-Z

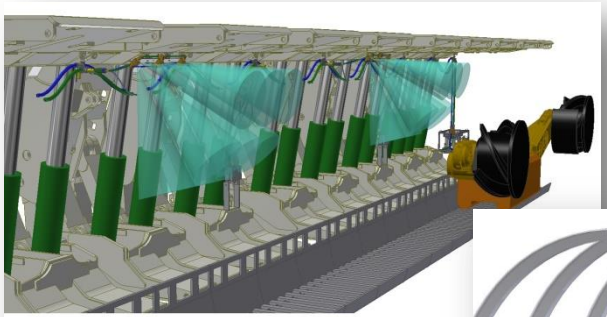

STK-R


STK-ZZ

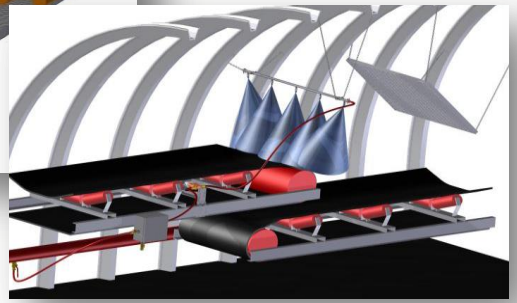
IMPROVEMENT OF WORK SAFETY

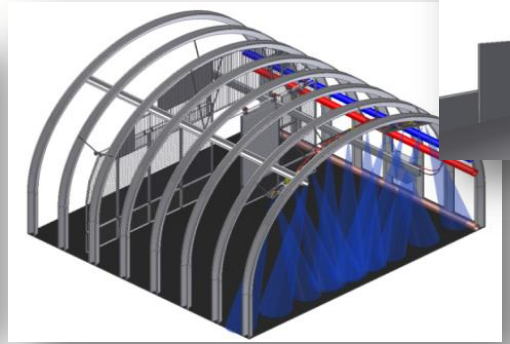
Spraying installations

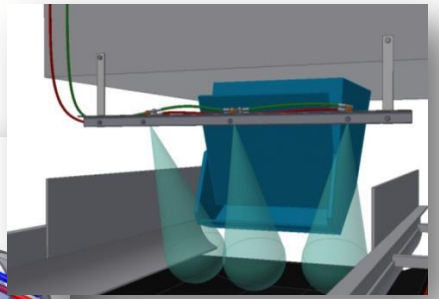
- System of longwall air-and-water spraying system of KOMAG and KOMAG-n (for low faces) types.
- BRYZA-BA air-and-water sprinklers of transfer points and water sprinklers of ORKAN type.
- Air-and-water roadway anti-dust barriers of CZP BRYZA type and ORKAN type.
- PASAT and NEPTUN air-and-water spraying systems for preparation plants.



So far 123 installations have been implemented.







IMPROVEMENT OF WORK SAFETY

Spraying installations

Air-and-water spraying installation for a longwall shearer.

So far 27 installations have been implemented in Polish and foreign mines.

System of sector water spraying system for a roadheader.

So far 2 systems have been implemented in Polish mines

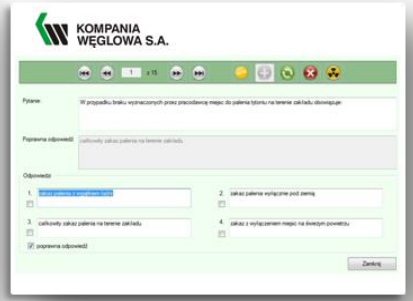
IMPROVEMENT OF WORK SAFETY

Multi-media training materials – reconstruction of accidents

System aiding operational health and safety services (ZG Sobieski, ZG Janina)

Interactive operational manual of longwall shearer (KOPEX S.A.)

Interactive training materials (ZG JANINA)



Generator of sets of questions used during operational health and safety trainings (KWK Brzeszcze)

Reconstructions of accidents (KGHM S.A.)

I THANK YOU FOR YOUR ATTENTION
AND
I INVITE YOU TO COLLABORATION

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