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MONITORING THE WORK ENVIRONMENT USING THERMAL IMAGING CAMERAS IN ORDER TO PREVENT THE SELF-IGNITION OF COAL

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Abstract

The occurrence of spontaneous combustion phenomena in coal mines is generated by the reaction of mineral substance with atmospheric oxygen and favoured by the oxidation (self-ignition tendency) of coal, an oxidant environment and by the conditions in which heat exchange with the environment takes place.

Preventing / Fighting against this phenomenon is regulated in the specific OHS requirements and in the General mining plan, comprising the technical and organisational measures for prevention and protection, as well as the costs related to this activity. However, despite all these measures, the combustion risk is reduced, but not totally removed.

A series of methods are available, along with different types and schemes for preventing/fighting against the combustion phenomenon, which involve higher or lower costs depending on the chosen option: direct and indirect measurements (gas-chromatographic analysis) of O₂, CO₂, CO, H₂, C_nH_m, gases concentrations and temperature, treatments with chemical inhibitors, technologies for under-pressure water injection, inertisation technologies etc.

Lately, monitoring production capacities through direct temperature means has been improved with portable thermal imaging cameras which simplify a lot the efforts and costs of the prevention activity. The applied procedure, advantages and disadvantages are analysed in the current paper.

Keywords: coal, spontaneous combustion, temperature, thermal imaging camera

Received: May, 2016; Revised final: June, 2017; Accepted: June, 2017

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