Safety issues when using a museums in unused mining workings

Andrei Ivanov\textsuperscript{1}, Kirill Shekov\textsuperscript{1}, Vitali Shekov\textsuperscript{1}, Krzysztof Fuławka\textsuperscript{2}, and Witold Pytel\textsuperscript{2}

\textsuperscript{1}Institute of Geology, Karelian Research Centre RAS, (Russia)
\textsuperscript{2}KGHM CUPRUM Ltd. Research and Development Centre (Poland)

The underground space, which is not used for mining purposes, now serves more like a room for storing various goods, for organizing the production of goods, as mining museums, etc.

Using such space creates some dualism in its maintenance. On the one hand, it is simply an underground space, used as a storage, on the other hand the characteristics of this space are completely dependent on the natural conditions and properties of the rocks surrounding the mining workings. This is especially true for mining space used as mining museums, where it is unacceptable to cover mining workings walls with solid concrete support that will simply destroy the authenticity of the object. Whether it is necessary to have a mining engineer in the staff of such a museum?

The authors hold to the concept that regulations for the use of each underground space for use as a museum must be developed by professionals, but this space should be managed by ordinary museum workers, just as it is not necessary to be a professional mechanic to drive a car.

Besides the air conditioning, removing the water one of the most serious problems in the use of unsupported underground space is the control of the stability of the roof and walls of the workings to provide safety for visiting this museum people.

The authors propose some solutions to control the stability of mining workings using instrumental observation methods developed specifically for unprofessional workers in such underground museums.