A PROPOSED METHOD FOR OPTIMIZING COAL PILLAR DESIGN USING COALFIELD SPECIFIC UNIAXIAL COMPRESIVE STRENGTH

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ABSTRACT

The research described considers whether the variability in coal material strength as expressed through a series of UCS tests, could be used to indicate the variability in coal pillar strength. The aim of the research is to be able to use a distribution of UCS tests as an input into the coal pillar strength calculation. This will allow the pillar design to be expressed in terms of a probability of failure rather than as the commonly used safety factor. Using a regional coal material strength curve as a baseline, coalfields which are comparatively stronger than the regional mean allows for optimisation. This is based on the stronger coalfield achieving lower probabilities of failure at similar safety factors. The research has considered actual UCS data from multiple mines in the Mpumalanga coalfields, and has proved that the variability in material strength between coalfields could allow for some optimisation using the proposed approach. Further research will be required to validate the results of the study in an underground environment.