

Fuzzy Risk Assessment of Atmospheric Confined Space Dangers at Mine Reclamation Sites

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Abstract

A confined space accident that occurred at the Sullivan mine in Kimberley, British Columbia in 2006 has brought to light the problem that certain reclamation activities can lead to unrecognized atmospheric hazards. In previous work (Mohammadi and Meech, 2008) we recommended that atmospheric risk assessments be carried out for man-made bulk-material structures such as waste dumps and tailings dams. In this paper we combine existing knowledge and theories about gas emissions from waste rock dumps to build a model that can assess the possibility of a hazardous atmospheric risk. The Atmospheric Fuzzy Risk Assessment (AFRA) methodology consists of an expert system software program that asks questions about waste dump properties and other operational factors in order to warn about potential problems and then estimate the possibility of their actual occurrence. The paper describes the development of AFRA including details on its technologies. Examples of its application to a number of waste dumps will be given and validation discussed for both synthetic and real confined space situations related to waste dump reclamation activities.

References

Mohammadi, L., and Meech, J.A. Implementing Atmospheric Risk Assessment in Mine Reclamation. *23rd International Conference on Solid Waste Technology and Management*, Philadelphia, March, pp.12, 2008.