World Academy of Science, Engineering and Technology
International Journal of Computer and Systems Engineering
Vol:10, No:12, 2016

Numerical Simulation of the Coal Spontaneous Combustion Dangerous Area in Composite Long-Wall Gobs

Authors : Changshan Zhang, Zhijin Yu, Shixing Fan

Abstract : A comprehensive hazard evaluation for coal self-heating in composite long-wall gobs is heavily dependent on computational simulation. In this study, the spatial distributions of cracks which caused significant air leakage were simulated by universal distinct element code (UDEC) simulation. Based on the main routes of air leakage and characteristics of coal self-heating, a computational fluid dynamics (CFD) modeling was conducted to model the coal spontaneous combustion dangerous area in composite long-wall gobs. The results included the oxygen concentration distributions and temperature profiles showed that the numerical approach is validated by comparison with the test data. Furthermore, under the conditions of specific engineering, the major locations where some techniques for extinguishing and preventing long-wall gob fires need to be put into practice were also examined.

Keywords : computational simulation, UDEC simulation, coal self-heating, CFD modeling, long-wall gobs
Conference Title : ICCMS 2016 : International Conference on Computer Modeling and Simulation
Conference Location : Miami, United States
Conference Dates : December 05-06, 2016