Dust management strategies for improving occupational health and safety in underground coal mines

B. Xie[1]

1.Researcher, China University of Mining and Technology, Xuzhou China 221116. Email: xiebiaocumt@163.com

ABSTRACT

Coal dust (or rock dust) is one of the major hazards in mines, especially in underground coal mines. Airborne dust in mining or heading faces can easily reach a dangerous concentration due to the semi-enclosed nature of the roadways and the hysteresis of ventilation. In addition to increasing the risk of coal dust explosions, high concentrations of coal dust may lead to the development of coal workers' pneumoconiosis (CWP), which is caused by long-term exposure of miners to respirable dust. CWP cases have been widely reported in the major coal producing countries, and the situation has become more serious in recent years. For example, according to Chinese official statistics, 19,468 new cases of pneumoconiosis were reported in 2018, with the vast majority of cases occurring among coal miners. In the U.S., a 2018 survey showed that at least 10 percent of miners with more than 25 years of work experience were likely to have pneumoconiosis. A news report from Australia showed that nearly 20 new CWP cases were detected in Queensland in February 2019, and this number may rise in the future. Therefore, the pneumoconiosis has become a common problem in the global coal industry. An effective means of reducing the incidence of pneumoconiosis is to control the generation and diffusion of dust particles from the source, thereby decreasing the duration and intensity of exposure of miners to dust. The treatment of coal dust is a comprehensive work, requiring stringent dust management, accurate detection means, efficient dust collection technologies. This study mainly presents some dust treatment strategies adopted by major coal producing countries and the latest dust detection and control technologies. In addition, according to the current issues, corresponding solutions will be proposed to improve the level of occupational health and safety in coal mines.