Design and implementation of the monitoring system for underground coal fires in Xinjiang region, China

Dang Li-bo (1), Wu Jia-chun (2), Liu Yue-xing (1), Chang Yuan (2), and Peng Bin (1)

(1) Xinjiang Coal Fire Fighting Bureau, urmuqi, China (danglibo1987@163.com), (2) Xinjiang Coal Administration, Urmuqi,China

Abstract: Underground coal fire (UCF) is serious in Xinjiang region of China. In order to deal with this problem efficiently, a UCF monitoring System, which is based on the use of wireless communication technology and remote sensing images, was designed and implemented by Xinjiang Coal Fire Fighting Bureau. This system consists of three parts, i.e. the data collecting unit, the data processing unit and the data output unit. For the data collecting unit, temperature sensors and gas sensors were put together on the sites with depth of 1.5 meter from the surface of coal fire zone. Information on these sites' temperature and gas was transferred immediately to the data processing unit. The processing unit was developed by coding based on GIS software. Generally, the processed datum were saved in the computer by table format, which can be displayed on the screen as the curve. Remote sensing image for each coal fire was saved in this system as the background for each monitoring site.

From the monitoring data, the changes of the coal fires were displayed directly. And it provides a solid basis for analyzing the status of coal combustion of coal fire, the gas emission and possible dominant direction of coal fire propagation, which is helpful for making-decision of coal fire extinction.