

Project Title: Improved Safety through Application of Risk Management in US Underground Coal Mines: A RISKGATE Approach

Organization: Virginia Polytechnic Institution and State University

Partnerships: *Academic Research Partners:* The University of Queensland, and The University of New South Wales; *Supporting Industry Partners:* Anglo American Metallurgical Coal (AU), Arch Coal, Inc. (US), Centennial Coal Company, Ltd. (AU), Cliffs Natural Resources (US), Consol Energy, Inc. (US), Peabody Energy (US and AU)

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Focus Area: Safety and Health Management

SYNOPSIS

Problem Statement and Justification: Recent high profile mine accidents, including the Upper Big Branch Explosion in 2010, have highlighted the need for innovative and effective approaches to mine safety. While risk assessment and management is a well-recognized approach to improving and ensuring health and safety in a multitude of industrial and energy sector applications, including petroleum, nuclear, and mining industries it is seldom applied to the US coal mining industry. Risk management approaches allow for inclusive stakeholder engagement; innovation in management and technology, along with rapid integration; and ready identification and mitigation of risk, even if that risk is specifically identified through regulation.

Impact of the Research: This research has great potential for positive and substantial impact. Mining companies in the United States have robust, dedicated safety programs with zero harm goals, but are often driven by compliance with regulations. In some cases, these safety programs focus on root cause analysis, but this can be a flawed approach because it is often difficult to trace major accidents to a single root cause. The US regulatory framework was designed to create a safer mine environment in order to protect the miner, but the prescriptive nature of the law makes the application of more innovative techniques nearly impossible. The combination of safety compliance goals with a root cause analysis approach have made mines safer over time, but also makes the ultimate goal of reaching zero accidents unattainable. The proposed work on applying risk management procedures has great potential to reduce accidents and fatalities in the US underground coal mining sector, as well as the broader mining sector.

Objectives and Research Approach: The objective of this research is to examine how risk management approaches can be applied in a comprehensive manner to the US underground coal mining industry to improve mine safety. This will be accomplished through a partnership with two Australian universities as well as study and adaptation of an ambitious Australian research project: RISKGATE. Australia is widely recognized for progressive practice in mine safety regulation, and application of risk management. RISKGATE is an interactive online risk management system, sponsored by the Australian Coal Association Research Program (ACARP), which provides operators with a body of knowledge to assist in implementing risk management approaches in Australia. The aims of this research are to:

- Identify factors that could contribute to a change in risk management in the US.
- Develop strategies for implementation of risk management approaches in the US utilizing the RISKGATE body of knowledge.
- Apply these strategies to three high risk areas in US underground mine safety: Fire and Explosion Prevention, Ground Control, and Moving Equipment.
- Disseminate findings and recommendations for application of these strategies to the entire body of US underground mining health and safety topics, with implications for the rest of the US mining sector considered.

