

# Research on the Importance of Safety Competency of Coal Mine Employees and Strengthening Measures

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**Abstract:** At present, improving the safety quality of enterprise employees is the most important to promote safe production. In response to the prominent issues currently exposed in the safety competency of coal mine employees, this paper systematically analyzes key problems such as weak safety awareness, lack of safety skills, nonstandard safety behaviors, and ineffective safety training. It thoroughly demonstrates the strategic value of improving employee safety competency in accident prevention, sustainable corporate development, and the construction of intrinsically safe enterprises. Targeted comprehensive strengthening measures are proposed, including enhancing systematic safety education and training, improving multi-dimensional incentive mechanisms, optimizing working environments and support conditions, and strengthening safety culture leadership. These measures aim to comprehensively elevate the safety competency of coal mine employees, laying a solid foundation for safe production and sustainable development in the coal mining industry.

**Keywords:** Coal mine enterprises; Employee safety competency; Importance; Strengthening measures.

## 1. Introduction

As a strategic pillar of China's energy system, coal mines directly impact national energy security and the sustainable development of the economy and society [1-3]. Currently, China's coal mining environment is characterized by the "three highs and one complexity"—high gas concentration, high water hazard risks, high ground stress threats, and complex geological formations. Frequent major disasters such as gas outbursts, water inrushes, and roof collapses pose severe challenges to accident prevention [4-6]. Against this backdrop, employee safety competency has become a core element in building an intrinsically safe defense line for coal mine enterprises.

Enhancing employee safety competency holds multi-dimensional strategic value [7-8]. In terms of accident prevention, strengthening safety awareness, standardizing safety behaviors, and improving emergency response capabilities can effectively reduce accident rates by 15%~20% annually. In terms of life protection, scientific safety skill training enables employees to perform self-rescue and mutual rescue during disasters, significantly reducing casualties. Economically, improved safety competency reduces production losses from accidents, enhances equipment efficiency, and boosts annual comprehensive corporate profits by 8%~12%. For sustainable development, cultivating an intrinsically safe workforce provides talent support for intelligent transformation and green transition, facilitating a strategic shift from "scale expansion" to "quality and efficiency." Therefore, an in-depth study of the importance of safety competency in coal mine employees and strengthening measures holds significant practical value for promoting safe production and healthy development in the coal mining industry.

## 2. Deficiencies in Safety Competency of Coal Mine Employees

Coal mining enterprises face multiple issues regarding

employees' safety competency, including weak safety awareness, lack of safety skills, nonstandard safety behaviors and ineffective safety training.

### 2.1. Weak Safety Awareness

Some coal mine employees lack sufficient understanding of the importance of safety production and basic risk prevention awareness. In daily operations, they exhibit complacency and negligence, failing to strictly adhere to safety regulations and operating procedures, and even engaging in non-compliant operations. For example, some workers enter work areas without wearing required protective gear or operate equipment without following proper procedures, skipping steps and creating hidden hazards.

### 2.2. Lack of Safety Skills

With the continuous advancement of mining technology and equipment upgrades, the demand for employee safety skills has increased. However, a significant gap exists between the current skill levels of some workers and actual requirements. Many lack essential expertise and operational skills, struggle with new equipment usage and maintenance, and cannot respond effectively to emergencies. Additionally, safety training for new employees is often insufficient and superficial, leaving them inadequately prepared for job demands.

### 2.3. Nonstandard Safety Behaviors

Good safety habits are fundamental to safe production. However, some employees exhibit poor safety practices, such as habitual non-compliant operations, smoking at worksites, and haphazard material storage. These behaviors violate safety regulations and increase accident risks. Statistics show that a considerable proportion of coal mine accidents stem from such unsafe habits.

### 2.4. Ineffective Safety Training

While coal mine enterprises generally emphasize safety training, outcomes remain unsatisfactory. Training content

often lacks relevance and practicality, failing to align with actual work scenarios, which dampens employee engagement. Moreover, training methods are monotonous, relying heavily on lectures rather than hands-on practice or case studies, hindering true skill acquisition. Furthermore, lax evaluation and incentive mechanisms render training efforts superficial.

### **3. The Importance of Enhancing Safety Competency of Coal Mine Employees**

#### **3.1. A Key Factor in Accident Prevention**

Employee safety competency is the core element in accident prevention. Weak safety awareness may lead to overlooking hazards, insufficient safety skills can result in operational errors, and poor safety habits may cause habitual violations. According to relevant statistics, over 80% of coal mine accidents are attributed to inadequate employee safety competency. Therefore, improving safety competency enhances employees' ability to identify and mitigate hazards, standardizes their safety behaviors, effectively reduces accident probabilities, and safeguards both lives and corporate assets.

#### **3.2. An Internal Driver for Sustainable Enterprise Development**

In the dialectical relationship between safety production and economic benefits, safety competency serves as a bridge. A highly competent workforce executes safety protocols more efficiently, reduces accident-related losses, minimizes production downtime, and thereby boosts economic performance. Moreover, improved safety competency helps enterprises build a positive social image and strengthen market competitiveness. In today's increasingly competitive coal mining industry, safety performance has become a critical factor in resource acquisition and market expansion. Enterprises with high safety competency are more likely to gain policy support, win market trust, attract talent, and achieve sustainable development.

#### **3.3. The Foundation for Building an Intrinsically Safe Enterprise**

The construction of an intrinsically safe enterprise emphasizes eliminating hazards at their source, requiring employees not only to possess basic operational skills but also to proactively identify risks and prevent accidents [9-10]. Safety competency enhancement programs cultivate employees' abilities in risk anticipation, emergency response, and continuous improvement, internalizing safety concepts into mindset and externalizing them into actions. For instance, employees can independently assess workplace risks and take preventive measures in advance; during emergencies, they can respond swiftly and accurately to minimize losses. By consistently improving safety competency, enterprises can progressively achieve intrinsic safety, laying a solid foundation for long-term stability.

## **4. Measures to Enhance Safety Competency of Coal Mine Employees**

### **4.1. Strengthen Systematic Safety Education and Training**

(1) Refine Training Content: Develop scientifically tailored training programs based on the enterprise's actual conditions and employee needs. Content should cover safety laws and regulations, corporate safety rules, operational procedures, technical knowledge, and emergency response. Incorporate case studies of typical accidents to facilitate lessons learned and heighten safety awareness.

(2) Innovate Training Methods: Adopt diversified approaches such as on-site demonstrations, simulation drills, e-learning, case analyses, and group discussions. For example, simulate accident scenarios for emergency drills to improve response capabilities, or utilize online platforms for flexible self-paced learning.

(3) Enhance Assessment Mechanisms: Implement rigorous evaluations through theoretical exams, practical tests, and on-site Q&As. Only certified employees should be permitted to work. Link assessment results to compensation and promotions to incentivize participation.

### **4.2. Improve Multi-Dimensional Incentive Mechanisms**

(1) Material Incentives: Establish safety reward funds to recognize employees who identify major hazards or excel in emergency rescues. Tie safety performance to bonuses and salary adjustments.

(2) Moral Incentives: Organize awards like "Safety Role Models" or "Advanced Safety Teams" to honor exemplary individuals/units. Publicize achievements to foster pride and motivation.

(3) Career Development Incentives: Prioritize safety competency in promotions and evaluations. Encourage participation in safety trainings and skill competitions, offering advancement opportunities to top performers.

### **4.3. Optimize Work Environments and Support Conditions**

(1) Increase Safety Investments: Upgrade facilities (e.g., ventilation, dust/explosion-proof equipment) and ensure regular maintenance to guarantee safe operations.

(2) Streamline Workflows: Adopt advanced mining technologies to reduce labor intensity and hazardous exposure. Rationalize shifts to prevent fatigue-related risks.

(3) Prioritize Employee Wellbeing: Provide health check-ups, occupational disease screenings, and mental health support (e.g., counseling, stress-relief workshops).

### **4.4. Strengthen Safety Culture Leadership**

(1) Cultivate Safety Values: Integrate safety into corporate ethos via campaigns and education, transforming it into employees' voluntary practice.

(2) Foster a Safety-Conscious Atmosphere: Use slogans, bulletin boards, and events to keep safety top of mind. Encourage employee participation in safety initiatives.

(3) Preserve Safety Heritage: Pass down veteran miners' safety wisdom through mentorship and storytelling, helping new hires appreciate safety's historical significance.

## 5. Conclusion

Enhancing coal mine employees' safety competency is pivotal to safe production. Current challenges—such as skill gaps, nonstandard behaviors, and ineffective training—must be addressed to prevent accidents, drive sustainability, and build intrinsically safe enterprises. Measures like systematic training, multi-tiered incentives, optimized environments, and cultural leadership can holistically elevate safety competency, ensuring safer and more sustainable operations.

Moving forward, coal mine enterprises should persistently innovate safety management, while regulatory bodies must intensify oversight and invest in safety R&D and talent development. Only through collaborative efforts can the industry achieve lasting stability, securing energy supply and economic growth for the nation.

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