



# case study

## People's Republic of China Shenhua Group - Winner of WCA Award for Leadership on Mining Safety.

Seeking to standardise risk management across its own coal mines resulted in Shenhua Group devising the safety standards for coal mining across China.

The People's Republic of China has an incredible appetite for coal. It both produces and consumes more coal than any other nation in the world, and is poised to overtake the USA as the world's biggest consumer of coal-generated electricity.

In 2011, the State Administration of Coal Mine Safety and the China National Coal Association issued a new national standard, governing safety throughout China's massive coal mining industry. The standard had its foundations in a system devised a few years earlier by the Shenhua Group.

The Shenhua Group is the single largest producer of coal in the world's largest coal-producing country. The company produced 460 million tonnes of coal in 2012 – 13 per cent of that year's nationwide production.

### Rapid expansion

When the Shenhua Group's Coal Mine Safety Risk Control Management System caught

the attention of state and industry bodies, it had already been proven effective by a three-year trial in 100 of the country's mines.

The company began developing the system after a period of rapid expansion, during which it acquired several other Chinese coal companies and the resources they controlled. At the time, Shenhua's own coal fields were geologically simple and presented relatively few safety risks. With the new assets came more complicated conditions and higher risks. Shenhua realised it had a responsibility to re-think its approach to safety.

Some Shenhua mines had already introduced the NOSA (National Occupational Safety Association) Five Star Management System, developed by the South African mining sector, and others were using OHSAA 18001, the British Standard for occupational health and safety management systems. However the



Safety training in practice

company chose to develop a new system, tailor-made for its Chinese coal mines and their particular risks, culture, traditions and common practices. Taking all these factors into account made the system easier to implement and embed.

### Two theories

The Coal Mine Safety Risk Control Management System aims to identify unsafe behaviour and other sources of danger, assess the associated risks, and put measures in place to control them before they have a chance to cause harm. It provides mine operators with a methodology for identifying and assessing risks – the position risk assessment methodology – and a complete set of work processes designed to “pre-control” those risks.

The system is underpinned by two theories: the Heinrich Rule and the Theory on Internal and External Factors.

The Heinrich Rule, proposed by American industrial safety pioneer Herbert Heinrich, states that for every incident that results in

*“The system we’ve adopted focuses on managing and controlling the source of hidden dangers. It addresses the issue of what to manage and how to manage it. As a result, all risks can be pre-alarmed and pre-controlled.”*

Hao Gui, Senior Vice President, Shenhua Group



a major injury, 29 incidents occur that cause minor injuries, and 300 incidents occur that cause no injury; and that addressing the common incidents that don't cause injuries can help prevent incidents that do. The Theory on Internal and External Factors, meanwhile, provides a method for eliminating factors that may lead to an incident.

The two theories form the core of Shenhua's safety training programme, and must be mastered and taught by each coal mine's managers. Combined, they encourage a shift from the traditional passive methods of safety management – attempting to control risk as it occurs or afterwards – to a pro-active method, where accidents are prevented instead of mitigated.

### One process

The system uses a five-step process to manage risks – which can include people, machines, environment and operations:

1. Identify sources of danger.
2. Assess risks.
3. Apply risk management standards and measures.
4. Monitor the sources of danger.
5. Pre-alarm the sources of danger.

The implementation of the process breaks

down into five parts, which break down into 28 sub-systems, which break down into 160 elements. Implementation is managed using a specialist modular IT system. Each department and shift team at each mine can access the system via its own terminal, to input, process, track and interact with relevant risk control data.

This makes the system easy to apply and easy for employees to master. Every employee is involved in controlling and managing risk, each team's and individual's responsibilities can be clearly defined, and every source of danger is acknowledged and managed. The system warns of potential danger long before the relevant process milestones, virtually eliminating hidden dangers and losses.

The Shenhua Group has seen impressive results after adopting the system. For six consecutive years between 2007 and 2012, the company's fatality rate stayed below 0.03 per million tonnes of coal produced, and in 2012 it fell as far as 0.0043 per million tonnes. Safety performance in Shenhua Group subsidiaries has also improved, as has employees' awareness of safety.

### Nationwide improvement

The system has a built-in appraisal process, designed to deliver continuous improvement. This consists of a system review, intended to identify and improve the system's weak points, and management evaluation, where top management assesses the system's suitability with a view to making the decisions necessary to optimise its performance.

The national standard, AQ/T1093, is a condensed version of the system. It retains the basic workflow and sub-systems, while Shenhua's full Coal Mine Safety Risk Control Management System retains the complete set of specific requirements – one of the major advantages of a system tailored to a specific organisation.

As the appraisal process continues to improve and optimise the system, it becomes better standardised and even more systematic – furthering the cause of coal mine safety and quality standardisation across the whole of China.

## The streamlined risk management process at Shenhua



### Find out more

To read more about Shenhua visit [www.shenhua.com.cn/english/sy](http://www.shenhua.com.cn/english/sy)

To find out more about the World Coal Association and our work, visit [www.worldcoal.org](http://www.worldcoal.org) or email [info@worldcoal.org](mailto:info@worldcoal.org)

To find out more about the WCA Leadership & Excellence Awards, visit [www.worldcoal.org/awards2013](http://www.worldcoal.org/awards2013)



Regular safety exams for all employees