

Statistical Analysis of Sino-U.S. Coal Mining Industry Accidents

Guiling Wei

School of Economics, Huazhong University of Science & Technology

Wuhan, P.R. China, 430074

Tel: +86-186-0371-8066 E-mail: zdwgl@sina.com

Received: March 23, 2011 Accepted: April 30, 2011 doi:10.5430/ijba.v2n2p82

Abstract

Both China and the United States are large countries in coal production and consumption, however, the safety conditions of coal mining production in China are much worse than that of the U.S.. Although the Chinese Administration of Coal Mine Safety improved safety measures to tighten control on coal mining industry, the number of accidents, death toll and fatality rate per million tons were much higher than those of the U.S. in recent years. Based on the statistical analysis of Sino-U.S. coal mining accidents, the paper first came up with the caution from the comparison of Sino-U.S. coal mining industry accidents, then analyzed the reasons for China's coal mining industry being accident-prone, and then pointed out that the Chinese government should learn from the management experience of American coal mining industry. At last, it brought forward some conclusions and prospects for the development of China's coal mining industry.

Keywords: Coal mining accident, Fatality rate, Coal production

1. Introduction

It was reported that 1616 coal mining accidents occurred in 2009, down by 285 compared to the year before. The accidents caused 2631 people's death, down by 461 year-on-year, said Zhao Tiechui, the director of State Administration of Coal Mine Safety, while addressing a national meeting on workplace safety in Beijing (Beijing Daily, January 20, 2010). It also can be observed that the fatality rate per million tons was 0.89, decreased by 21.9 percentage compared with the same period last year. According to the report, three indexes, i.e. the number of accidents, death toll and fatality rate per million tons, showed a downward trend with the production's increase almost year by year in China's coal mining industry in the last decade. However, the absolute number of the three indexes remained much higher than that of the U.S. in the corresponding year in last decade. It suggests that China has gained the high coal production at an unnecessarily high cost, which is a thought-provoking problem and well worth discussing.

2. Statistical Analyses of Sino-U.S. Coal Mining Industry Accidents

Although both China and the United States are large countries in coal production and consumption, their safety conditions of coal mining production are quite different from each other in the last decade. The Chinese government has adopted a series of regulations and measures to improve coal production safety, but things are not so optimistic compared with that of the U.S..

2.1 Statistical Analysis of Coal Mining Industry Accidents in China

Statistics in Table 1 indicate that China's annual coal production increased gradually, however, the number of accidents, death toll and the fatality rate per million tons decreased year by year in the last decade with the year 2000 and 2001 being exception.

The year 2002 witnessed the most miserable days of China's coal mining industry in the last decade with 4403 accidents, 6995 people killed and a 5.07 fatality rate per million tons. While in 2009, the number of accidents, deaths toll and fatality rate ranked the lowest in the past decade. The number of accidents decreased by 2787, the death toll decreased by 4364, and fatality rate per million tons reduced by 4.18 in 2009 compared with those in the year 2002.

In conclusion, China's coal production totaled 20547.68 million tons from 2000 to 2009, with 30933 coal mining accidents, 51051 people killed and a 2.48 fatality rate per million tons in average.

2.2 Statistical Analysis of Coal Mining Industry Accidents in the U.S.

The annual production of coal mining, coupled with the death toll and fatality rate per million tons of the U.S. from 2000 to 2009 is presented in Table 2.

In Table 2, the American coal production totaled 11268.8 million tons from 2000 to 2009, with a death toll of 318, leading to an average 0.0282 fatality rate per million tons. In 2009, the coal production reached 1179 million tons in the U.S., with 18 people killed, down by 40 percent compared to the year before, resulting into a 0.0153 fatality rate per million ton, which made the year 2009 ranked the safest year in the past decade in American coal mining production.

It can be seen from Table 2 that the production of the American coal mining industry was on the rise while maintaining stability, meanwhile, the death toll and fatality rate per million tons fluctuated while declining slightly from 2000 to 2009 except the year 2006 that saw 47 people's death and a 0.0405 fatality rate per million tons.

3. The Caution from the Comparison of Sino-U.S. Coal Mining Industry Accidents

As we can see from the comparison of Table 1 and Table 2, from 2000 to 2009, the coal production of China is 1.8 times as much as that of the U.S.; The death toll of China is 161 times the amount of that of the U.S.; The fatality rate per million tons of China is 88 times as much as that of the U.S.. That is to say, in the last decade, China gained its coal mining industry production of 9278.88 million tons higher than that of the U.S. at the expense of 50733 coal miners' lives. Namely, every more million tons of coal produced in China, 5 to 6 more Chinese miners' lives than that of the U.S. devitalized in the coal mining industry. In recent years, the Chinese government has been emphasizing the security problem of the coal industry and has closed some small illegal private-owned mines, but the fatalities rates are still well above that of the U.S.. Worse still, these figures did not cause the authorities' much attention, some of whom, with the temptation of money, profaned the sacred approval powers endowed by the people, giving green light to the individuals and the black-hearted coal owners, and conducting all the legal licenses for them, including the mining licensees, coal production licensees, safety production licensees, the business licensees and coal owner's qualification certifications, etc. With these legal procedures' cover, the lacking-legal-consciousness mine owners have been engaging in the dirty work of stealing nation's resources and trampling the miner's lives, having nothing to fear. In 2007, TianYun, a Chinese coal owner in Xiaoyi coal mine, in Shanxi Province, overcame every obstacle by means of money's magic and relationship, with the help of the resources reorganization departments of Xiaoyi city, Luliang city and Shanxi province, who conducted various coal mining production licenses for him, produced 0.15 million tons of coal within 3 months, and made a profit of 60-70 million Yuan; A gas explosion accident happened in Xiaoyi coal mine, with 34 miners killed on the spot on June 13, 2008.

The Chinese Administration of Coal Mine Safety website imparts: A gas explosion accident happened in Xinxing coal mine in Hegang City, Heilongjiang province, on November 21, 2009, with 108 coal miners killed; Another gas explosion accident happened at 10 o'clock, on November 22, in Guojia bay coal mine in Tianwan town, Chenxi County, Hunan province, 15 people killed and 11 people injured, 2 of whom badly burned. In the evening on November 26, a gas explosion accident occurred in Xingren town, Buyi and Miao autonomous prefecture, in Southwest Guizhou province in China, with 9 people killed and 1 person unaccounted for.

Such accidents occur almost every day in China, but we should not take it for granted. If we just ignore and watch them come and go dispassionately, what is waiting for us is forever the next disaster. This should give warning to the Chinese government and the Chinese coal mining industry: if the government doesn't take measures to strengthen legislation, and formulate coal mining industry production safety act, and trace legal responsibility toward the parties of fatal incidents as well as the executants of the corresponding management departments, what accompanies the high growth of China's coal mining industry will be the tragic scene of much more coal miners' death than before.

4. The Reasons for China's Coal Mining Industry Being Accident-Prone

We can conclude from the comparative analysis of the Sino-U.S. coal mining industry accidents, that China's coal mine accident occurred more frequently, and more catastrophic accidents had happened, the death toll was much higher, and more rescue difficulties existed compared with those of the U.S.. There are five main reasons for these phenomena:

The first reason is the administrative departments, especially governments at the county and township levels and the relevant departments' lax execution of the law and deficiencies in supervision; The license approval system is not normative, which allows the coal mines with unqualified operating conditions to engage in coal production, even those who ought to shut down continue to operate, giving rise to more coal mine disasters.

The second reason is that the lawless mine owners, who usually engage in irregular construction and illegal production, are concerned with only money instead of miner's lives. With their confused internal enterprise management, they

ignore the hidden dangers and organize the production in the long-run, overloaded and overcrowded, without any safety facilities and security situation.

The third reason is the underground illegal storage and usage of explosives, which causes numerous hidden troubles.

The fourth reason is the illegal transportation with un-riot maneuvering tricycles underground.

The fifth reason is the corruption problem: the officials and coal owners collude with each other, disregarding for human life.

Based on the facts that China's coal mining industry mortality rate is much higher than that of the U.S., and safety accidents happen frequently, Chinese government has formulated a series of policies to ensure the safety of coal production. The standing committee of the 7th National People's Congress in the 28th meeting passed the Law of the People's Republic of China on Safety in Mines in November, 1992. The State Council issued the Coal Mine Safety Supervision Regulations of the People's Republic of China in November, 2000. The National Development and Reform Commission published the Coal Gas Control Experience 50 which required that gas treatment special funds should be withdrawn according to the standard of 15 Yuan per ton of coal in March, 2005. But so far, neither legal provisions nor administrative regulations have involved the legal sanction and punishment on the party concerned who causes the mine accident.

5. The Management Experience of American Coal Mining Industry

The death toll in the coal mine accidents surpassed 2000 in the U.S. before 1935, according to the U.S. Department of Labor's Bureau of Labor Statistics. After the Coal Mine Safety and Health Law was enacted in 1969, especially the Mine Safety and Health Law was enacted in 1977, injuries in coal mines began to drop dramatically, fatal accidents with more than 2 people killed had been eliminated at the end of 1992. The U.S. Department of Labor's Bureau of Labor Statistics showed that serious fatal accidents totaled 27, and 408 people died during the 40 years from 1959 to 1999 in American coal mines.

There are three types of accident investigations that the federal Mine Safety and Health Administration organizes after serious injury accidents happen in American coal mines. Firstly, the investigation for the general accident cause, the main purpose of which is to make clear the cause of the accident, preventing and avoiding the coal mines accident or similar accidents in mines with similar conditions happen. Secondly, the special investigations for heavy casualty, the purpose of which is to determine the operation and management responsibility for the accidents, so that the relevant mine operators could be liable for the criminal responsibility, and the facts basis can be provided for criminal actions and criminal charges. Thirdly, the investigation for mine safety and health inspectors concerned in the process of accident investigation, which is internal investigation, in order to avoid investigators' negligence in work or other reasons.

The U.S. coal mine safety supervision institutions emphasize their independence, and prevent inspectors from forming the common alliance with mine owners and local governments for private interests. Affiliated with Mining Safety and Health Bureau, the Coal Mine Safety and Health Office is a federal agency, with 11 regional offices and 65 mine offices under its jurisdiction. These offices have neither interest relationship with mine owners, nor any affiliation with state and county governments. The federal safety inspectors in any region should rotate every two years. If any fatal accident with more than 3 people killed happens, it is not local safety inspectors but rather out-of-town safety inspectors sent by the federal office who will conduct the accident investigation. The inspectors have been endowed with great power as well as heavy responsibilities. According to the Federal Mining Safety and Health Act, if the inspectors find potential safety hazard, they have the power to order the coal mine to stop production immediately. But if the check information leaks out or the surveys are misled, the law enforcement personnel may be sentenced.

The Law of the People's Republic of China on Safety in Mines issued and implemented by the Chinese government on May 1, 1993, has played an important and positive role in avoiding mine accidents, protecting miners' personal safety, and promoting the healthy development of the mining industry. However, as China's legislation construction starts late, and the legislation techniques are comparatively backward, with 'legislation should not be fine but rather appropriate coarse, principled and generalized' as the guiding ideology, the enacted law has poor operability with many problems in it, compared with the American Mine Safety and Health Law.

6. Conclusions and Prospects

Both China and the United States are rich in coal resources. In terms of the energy consumption structure, coal still occupies an important position in total energy consumption in both countries. What's more, China's coal mining industry is in a dominant position in the development of national economy and energy consumption, and the actual demand for coal in China is far greater than that of the U.S.. China is rich in coal, but poor in petroleum and natural gas. Energy

demand is becoming increasing large with the speeding up of industrialization and modernization process in China. As the demand of electricity increases, the demand for coal increases, too. Coal mining is strengthened. As the result, China's annual coal production is higher than that of the U.S., and the production difference between them two is becoming larger and larger. China's coal production output is higher than that of the U.S. in the last decade. The difference of coal production output between China and the U.S. has increased from 240 million stone tons in 2000 to 1781 million stone tons in 2009. This neither the shield against the so-called 'America also experienced the peak period of coal mine accident', nor the reason for the death toll of Chinese miners outnumbered the U.S. greatly.

Strictly implementing the 'Security First, Precaution Crucial' policy, China's coal mining industry promotes comprehensive safety management by means of scientific and technological progress, meanwhile, it strengthens the safety and technical training, and carries out various forms of safety propaganda activities. All these measures bring upturns of coal production safety, but the accidents' number and death toll remain stubbornly high, which caused a large number of miners' casualties, serious property damage and great social effluence; At the same time, it is gaining extensive concern of the international community. In general, how to thoroughly solve China's coal mine recurrence accidents and ensure safe production of coal mining industry should be the most urgent problems for Chinese central government and the local governments at various levels.

With the striding development of the economy, contemporary China is experiencing a social transition period in which problems are inevitable. Coal mining industry is no exception. We must face and can not avoid these problems. The Chinese government should actively learn from the management experience of the American mine accident. Firstly, it should strengthen the legislation of safety production in coal mine to ensure coal miner's safety of lives. Secondly, the Chinese government should reinforce legislation of coal production; at the same time, the governments and departments at all levels should enforce the laws strictly, trying to avoid the phenomenon such as 'officers and coal owners collude with each other' and 'officers and coal owners share the interest together'. Thirdly, the State functionaries and heads of state-owned enterprises who investment in the coal mines, regardless of how much, must resolutely denounce all. Lastly, the officers who collude with coal owners in mine accident should get severe punishment, and the mine owners who disregard for miner's life and ignore the safety production should be brought to justice. Only in this way, could the Chinese miners be away from blood and tears, and China's coal mining industry could development in a safe, orderly and healthy way.

References

Beijing Daily, January 20, 2010

Mine Safety & Health Administration (MSHA). [Online] Available: <http://www.msha.gov/index.htm> (July 20, 2010)

National Bureau of Statistics of the People's Republic of China. [Online] Available: <http://www.stats.gov.cn>

State Administration of Coal Mine Safety. [Online] Available: <http://www.Chinacoal-safety.gov.cn> (July 20, 2010)

State Administration of Work Safety. [Online] Available: <http://www.chinasafety.gov.cn> (July 20, 2010)

The U.S. Energy Information Administration. [Online] Available: <http://www.eia.gov.cn>

U.S. Department of Labor. [Online] Available: <http://www.bls.gov/index> (July 20, 2010)

Table1. Statistics of Coal Mining Industry Accidents in China from 2000 to 2009

Year	Production (million stone tons)	Number of Accidents	Death Toll	Fatality Rate (million stone tons)
2000	1314.43	3443	5798	4.41
2001	1458.73	3082	5670	3.89
2002	1380.19	4403	6995	5.07
2003	1667.55	4143	6702	4.02
2004	1956.38	3639	6027	3.08
2005	2190.3	3341	5491	2.51
2006	2380.5	2945	4859	2.04
2007	2523.6	2420	3786	1.5
2008	2716	1901	3092	1.14
2009	2960	1616	2631	0.89
Total	20547.68	30933	51051	2.48

Source: State Administration of Work Safety and National Bureau of Statistics of the People's Republic of China.

Table2. Statistics of Coal Mining Industry Accidents in the U.S. from 2000 to 2009

Year	Production (million stone tons)	Death Toll	Fatality Rate (million stone tons)
2000	1073.6	38	0.0354
2001	1127.7	42	0.0370
2002	1094.3	28	0.0256
2003	1071.8	30	0.0280
2004	1112.1	28	0.0252
2005	1131.5	23	0.0203
2006	1161.4	47	0.0405
2007	1145.6	34	0.0297
2008	1171.8	30	0.0260
2009	1179.0	18	0.0153
Total	11268.8	318	0.0282

Source: Energy Information Administration and United States Department of Labor