

MINING ACCIDENT ANALYSIS IN INDONESIA (PRIMA SYSTEM)

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Abstract

The paper presents the result aimed to develop of mines safety management properly in Indonesian mining throughly characteristic of mines accident in Indonesia, especially in the Mineral, Coal and Geothermal sub sector. The analysis is based on data obtained from the Directorate Technique and Environment of Mineral, Coal and Geothermal reports, which mines accidents that occurred from 2003 upto 2010^[3], with focused on 2009 included 44 fatality and 2010 included 94 serious mines accident and 15 fatality. The analysis of accidents were used 9 groups criteria of coal mining accidents only. The hazards and risks are improperly maintained will become main sources of accident in the workplace, and the failure to follow of the instruction or procedure properly is an accident causational. The increasing of Indonesian coal production on year to year will be given positive and negative impacts directly or indirectly to the society, economy and ecology.

Keywords: hazard; risk; accident, mines accident, mining, production.

1. Introduction

An incident is an unplanned event or gradual process that results in harm to people or damage to property. The immediate goal of any incident investigation is to find out what happened and why, and the ultimate goal is to make sure it never happens again. The purpose or objective of mines accidents analysis is to determine the sequences of events leading to failure, identify the cause of the accident, and find methods to prevent accident from recurring again. As known so far, one of the characteristics of the mining industry is high risks, any failure in the mine planning process that does not follow the rules properly then the loss can't be avoided, such as ; financial, workers, time, environmental and so many things. One of the risks faced by the mining industry today is an accident. Thousands of people have died from mining accidents each year. At the present China holds the record for the number of mine accidents resulting in

death every year. In Indonesia, mining accidents is a problem for the sustainability of the mining business process to the future. Regarding to research of accidents by H.W. Heinrich and others person who studied cases of industrial accidents concluded that unsafe acts by implication of human errors (majority) and unsafe conditions were significant contributed^[4].

According to the International Labour Organisation (ILO), the number of work-related accidents has increased, and more people are dying from workplace injuries and illnesses. The ILO has subsequently attacked employers for neglecting Health and Safety standards at work. On the messaged by the Director General of ILO Juan Somavia has said for 2011 each every year around 337 million people are victims of work accidents and more than 2.3 million people died because of occupational injuries or work-related diseases and also said "A safety culture must be nurtured through partnership and dialogue - governments, employers and workers creating safe and healthy workplaces." We are still remember of dramatic events such as the nuclear accident at Fukushima, Japan last year or the Pike River mining accident in New Zealand last two years feature in the headlines. Yet most work-related injury, illness and deaths go unnoticed and unreported. As in line with the ILO program, the Indonesian government through Minister of Man Power and Transmigration also announced last year 2011 to achieve the "Safety Culture" in the workplace for all industries, include mining industry.

With so many accidents, illnesses and deaths can make the instability of the business industry, so we must think what is the best way to find the solutions how to reduced, prevented or eliminated hazards and risks in the workplace environment. It is a matter of respecting the dignity of the human being through the dignity of work; of shaping policies that reflect the central role of work in people's lives, so sustainable development will be running well to produced the balancing of equity of life, between society and economy. ILO calculation has said the losses of money caused of working accidents in the developing countries are around 4% from GNP¹, it's too much money. The JAMSOSTEK² of Indonesia reported in 2011 has

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¹ Abbreviation, GNP: Gross National Product.

² Abbreviation, JAMSOSTEK: Jaminan Sosial Tenaga Kerja.

said 0.7% of Indonesian employments have working accidents which contributed lost of national income achieved around USD 6.0 billions. Due to, the actions should be created to prevent the accidents in the workplace or in the mines site operations.

The mining industry has an important and strategic role in economic development in Indonesia with coal production is increased significantly from 1996 to 2011 of 50.33 upto 371.00 million tons. Indonesia is a second largest of coal exporter country following Australia, with total export more than 70% from national output. Based on data from World Bank, more than 50 countries dependent on mining that provides at least 6% of exports or play an important role in the domestic economy. Mining plays an important role in the Indonesian economy. In the year 2008 to year 2010 revenues increased from IDR 42.12 trillions to IDR 66.33 trillions³, so it can be said of mineral and coal mining sub-sector is contributing around approximately 4.4% of total state revenue.

The remarkable success in the coal mining industry is also contributed the negative impacts to sociology indirectly, such as the mining accidents always insist and sometime can not be avoided. For this reason, we need how to develop the best strategy to find solutions how to effectively prevent, avoid and reduce accidents in the workplace, particularly in the mines site activities. Every country has the different characteristic of people, culture and conditions as well, so the safety startegy implementation of the policy or regulations have also different ways to applied.

Risk management is a well known loss control methodology which has been applied by many industries, including oil and gas, chemical, nuclear, aviation, environmental, agriculture, forestry, transportation, civil construction, and aerospace. Risk management is the process of identifying, assessing, and controlling risks arising from operational factors and making decisions that balance risk costs with mission benefits. Integrating risk management into mission planning, preparation, and execution, and also making risk decisions at the appropriate level in the chain of command, and the finally is make an acceptable or tolerable of risks. These industries are considered about the risk managementas an integral part of their daily business. Many standards are available, such as: European Standard, 1997; Department of Defence, 2007; Canadian Standard Association, 2002; Australian Standard, 2004; NZ Standards, 2004; MSHA USA Standard^[1]. Several countries

have started to develop of risk assessment approaches for mining industry, such as Indonesia.

2. Methodology

This paper is based on historical mines accident data for the period time from 2003 to 2010 obtained from the Directorate Technique and Environment of Mineral, Coal and Geothermal reports, but the analysis of fatality mines accident is concerned only in 2009 and 2010 cause in these time period called a mines disaster in Indonesia in particularly 2009.

According to Haimes (2004), Brauer (2006) and various internationally recognised standards (Department of Defence, 2000; Canadian Standards Association, 2002; Standards Australia/Standards New Zealand, 2004), the risk assessment process involves three steps: 1. risk identification; 2. risk analysis; 3. risk evaluation^[1]. But also according to health and safety executives said there is five step to risk assessments as follow: 1. Identify the hazards; 2. Decide who might be harmed and how; 3. Evaluate the risks and decide on precautions; 4. Record your findings and implement them; 5. Review your assessment and update if necessary^[5]. in this paper will be used the analytical approach to find the solution to better mining industry to the future in Indonesia.

In the past of eight years, the mines accident in Indonesian mining excluded oil & gas mining has shown increasing from 2003 upto 2010 with total fatality is 200 miners died, particularly in 2009 the mines dissaster are occured with of 44 miners, and the highest contribute is come from the underground coal mining (small scale mining) with 33 miners. According the investigation accident analysis has concluded the mines exploded caused of human error. It's mines accident occured when the electrician will be connected the electric lines to the new stope or face of coal mines, without closed the circuit braker previously. In my option, human error can not be blamed stand alone, because mismanagement also contributed to this accident, otherwise inadequate air ventilation when the mines activities run also give the contributed as well. In other words can be said to be sufficient amounts of methane gas to burst (9.5 – 15 % of volume) and followed the burning of coal dust in the same time. The Fig. 1 below shown the mines accident statistic in Indonesia, with three types of injury classifications such as light injury, serious injury and fatality.

³ Bank of Indonesia, 26 March 2012, exchange rate, 1 USD = IDR 9,181.

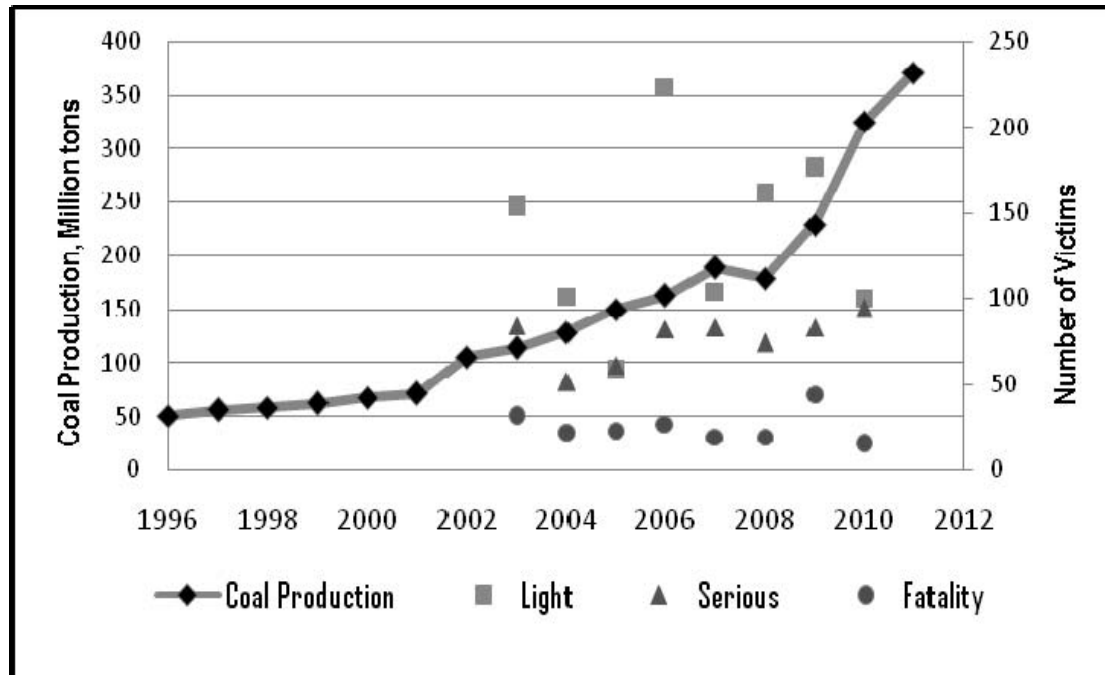


Fig. 1 Indonesian Coal Production and Mining Accident⁴

⁴Directorate General of Mineral and Coal, Ministry of Energy and Mineral Resources of Indonesia, 2011.

Indonesian mining accident definition is involved 5 (five) elements regarding to the Minister of Mining and Energy No. 555.K/26/M.PE/1995, Occupational Health and Safety in General of Mining, Article 39, as follow:

- The accident is actually occurred
- Resulting in injury to mine workers or people who were given permission by the Technical Mines Manager or KTT
- As a result of mining activities
- Accident occur during working hours toward to the miners who may have injuries or any time people are given permission and
- Accident occurred in the area of mining activity or project area.

Working accident definitions are the accident happened on the worker / employee of a company because of the employment relationship, the mines accident is part of the working accident. Criteria for occupational injuries must meet the following requirements:

- Accident is occur
- Accidents happen to the workers / employees
- The accident occurred because of the employment relationship
- The accident occurred during working hours.

Regarding to mines accidents are occurred in 2010 included of 94 serious mines accidents and 15

fatality mines accident, with involving 9 criterias analysis in these period of time, as follow; 1. Cause of accident; 2. Source of accident; 3. Type of accident; 4. Type of job; 5. Experience time to work; 6. Age of worker; 7. Location of accident; 8. Shift time working; 9. Type of company. All these criteria will be explained only in 6 critireas as following of the pictures:

- In the Figure 2 has shown the highest percentage of 29% caused of mines accident is occurred when workers conducted the job shall not following the procedure properly or unprocedure, and in Figure 3 has shown the highest percentage of 25% sources of mines accident is occurred involving haul equipments.
- In the Figure 4 has shown the highest percentage of 28% type of mines accident is occurred when workers were collided to other objects, and in Figure 5 has shown the highest percentage of 34% mines accidents is occurred involve the mechanics.
- In the Figure 6 has shown the highest percentage of 35% location of mines accident is occurred in the hauling road, and in Figure 7 has shown the highest percentage of 31% of mines accidents is occurred in the first shift time working around 08:01 – 12:00.

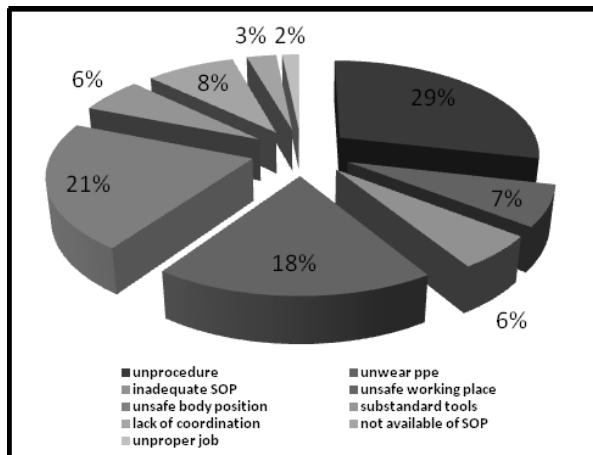


Fig. 2 Causes of Mines Accident

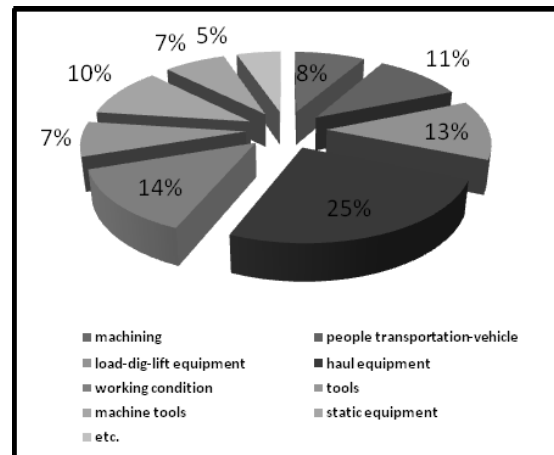


Fig. 3 Sources of Mines Accident

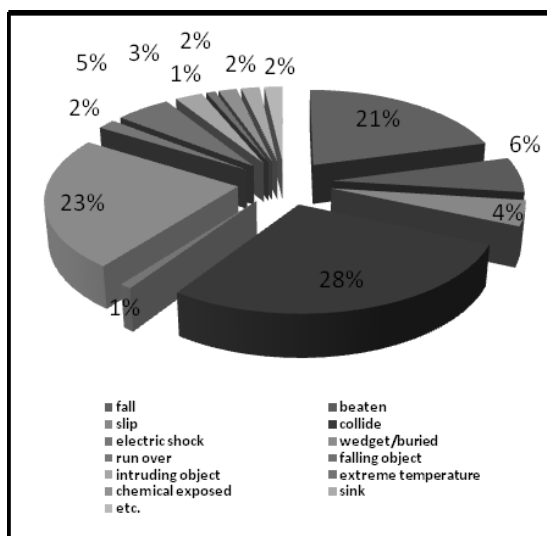


Fig. 4 Type of Mines Accident

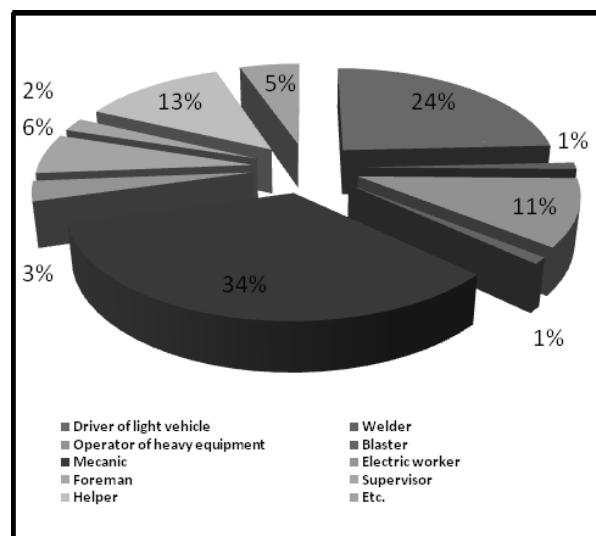


Fig. 5 Type of Job

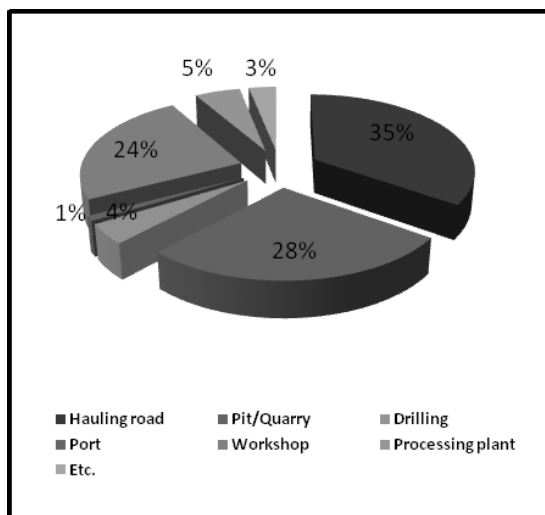


Fig. 6 Location of Mines Accident

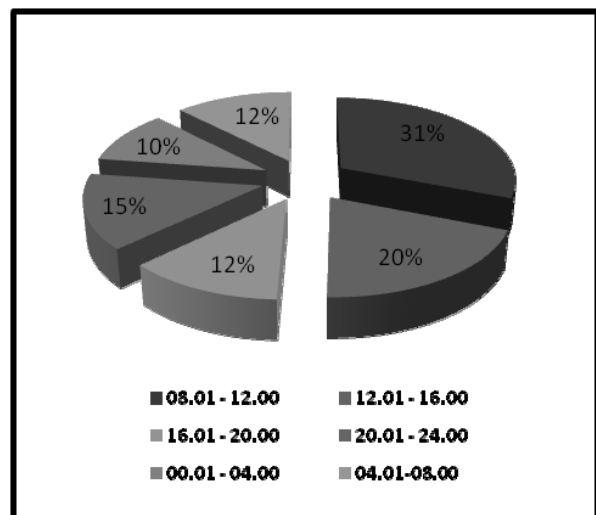


Fig. 7 Shift Time Working of Mines Accident

3. Conclusions

Regarding to mines accidents causational in an expaliation above majority is human error or failure of human. Considering it, to many mines accident occurances in the mines site locations, so need the proactive action how to reduced and avoided the accidents. Risk management is required not only the involvement of the management but also the commitment of management and all parties concerned. In this concept, mines accidents analysis included hazards and risks are useful and effective method should be identify, quatify and evaluate of the accidents. The analysis of mines accident is part of checking and corrective action in the safety management system, as stage of control. If we can control the hazards and risks in the workplace or

equipments, so we can control the accidents properly.

All the main concepts are increasingly aware of the importance of occupational health and safety (OHS) management needs in the form of systematic and fundamental management to be integrated with other enterprise management. This integration begins with the policy of the company to manage OHS implement as a Mining Safety Management System (MSMS). Management has a pattern of "Total Loss Control" is a policy to avoid losses that integrated with human resources, materials, equipment, processes, materials, facilities and environment with the pattern of implemented of basic management principles of **Plan, Train & Do, Check and Action &Improvement (PTDCAI)**^[6].

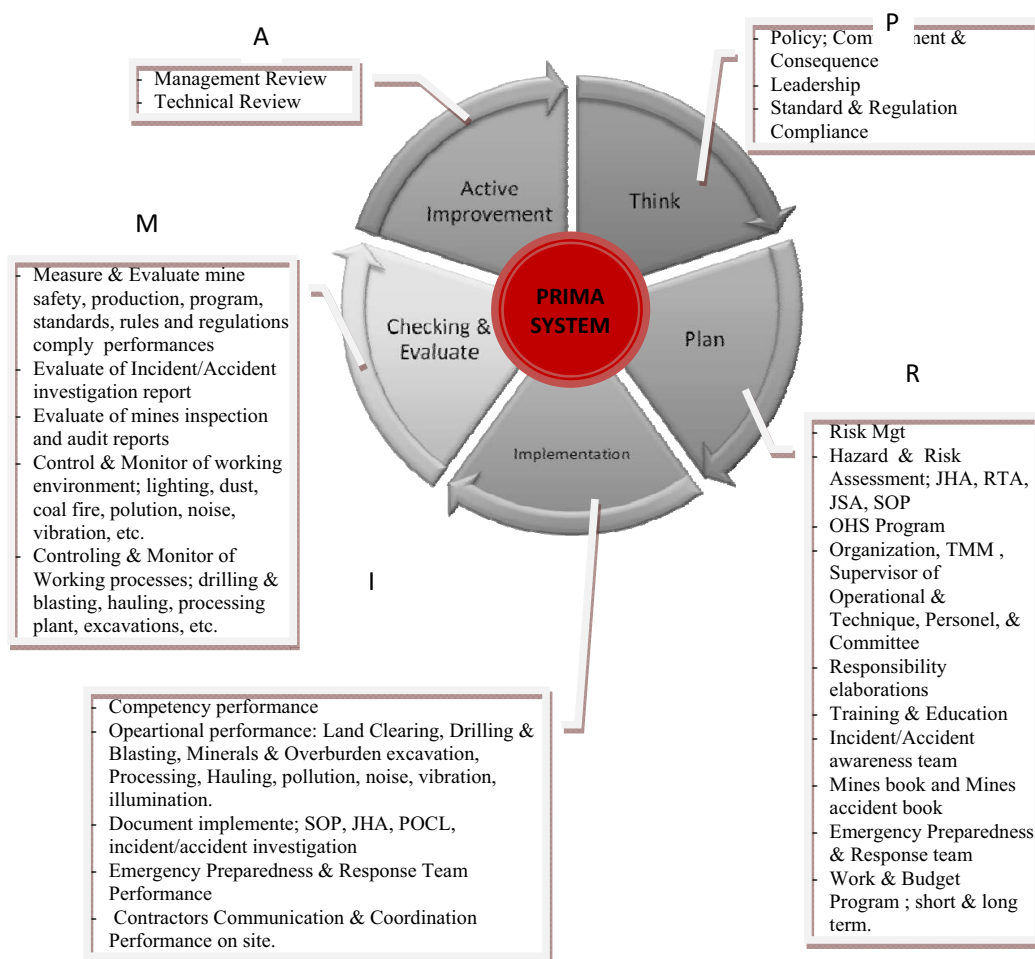


Fig. 8 PRIMA System

In the figure 8 above, will describe the flow of thinking to apply for the best practices contribute to mining industry, with “ the **PRIMA System**” for Indonesian coal mining industry, the PRIMA is abbreviation in Indonesian languages are explain, P

= Pikirkan (Think), R = Rencanakan (Planning), I = Implementasikan (Implementation), M = Mengecek & Mengevaluasi (Evaluation), A = (Aktif meningkatkan perbaikan (pro-Active Improvement).

Thus, to realize the PRIMA system in the surface mining company need to be implemented with proper planning and consideration, and one of the key to success lies in the role of the worker himself both as subject and object of protection intended. Judging from the economic aspect, by applying the PRIMA, hopefully the accident rate will decrease, so that compensation for accidents also decreased, and labor costs can be reduced, so if occupational health and safety effective will be able to increase productivity. This in turn then to encourage all workplaces / industry and public places have felt the need for cultural and OHS to be applied in every place and every time, so the OHS become one of the industrial culture or in other word called as the OHS culture. Finally, the best hope that accidents are decreased on the running year and achieved the production target as well with regulations and mining safety management system complianced, consistent and commitment properly.

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