



The brand-new global Prevention Strategy
of ISSA Mining for Safety and Health in Mining

SAFETY 7.0 – 7 GOLDEN RULES TO VISION ZERO

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“Industry 4.0” – “Mining 4.0” – perhaps you have already heard of these terms? These keywords signify the next stage of industrial production. The internet and production technologies are growing closer together. Machines can communicate with one another, wherever they may happen to be located. The “Internet of Things” is the appropriate term. But what does SAFETY 7.0 mean? It is both brand new and traditional at the same time. It also has to do with the success of companies, with efficient production. And yet there is a great deal more at stake. It has to do with our lives and our safety – the supreme commodity in this world. What exactly SAFETY 7.0 means, what the number 0 stands for and the meaning of the number 7, and what this all has to do with mining will be explained in the following article.

Mining is a fascinating undertaking. Mining is indispensable for a country’s economic development, whatever that may concern: infrastructure, energy supplies or raw materials for industrial production. Mining has brought forth many technological developments and innovations that can currently be found in our daily lives. Mining is impressive, grandiose and repeatedly fascinates mankind with its immense dimensions. Miners throughout the world still work hard and, for this reason, are bound to one another in a special way. In mining, every man looks out for the other; you have to be able to rely on each other. That creates a strong bond.

The other side of the coin is that mining and disasters belong to normality in the media and thus also in our perception. Accidents at work and even catastrophes occur in mining, quarries, or raw material operations almost on a daily basis somewhere in the world. They are often associated with extremely serious injuries, or even a fatal outcome, for the miners affected and, in turn, dramatic consequences for the families of those involved. It could be in China, India, Russia, or somewhere in Africa, Asia

or America – it mostly does not happen in front of our door or in our neighbourhood. Perhaps because of this in the daily concert of negative headlines, we do not register these catastrophes any more in our minds. We write them off under the heading “Nothing special”, since there are, day in day out, more terrible news items about wars, civil wars, famines, or ecological disasters.

Things only really change if there is a dramatic number of deaths or when we are personally affected, close by in the vicinity, or can witness the rescue action live. In Europe, these three mining disasters in particular have recently generated media resonance:

The San José/Chile pit disaster beginning in August 2010 in the Atacama desert, in which 33 miners in a copper and gold mine were trapped 700 metres deep as result of a rock fall. They were saved through a dramatic rescue action 69 days later.

The accident on 1st October 2013 with three dead at the Untereibzsch potash production facility in Germany due to a massive escape of carbon dioxide.

The latest mining catastrophe from May 2014 in Soma/Turkey with 301 deaths and 85 injured miners on account of a mine fire in a lignite colliery.

These terrible and dramatic events of course only represent the tip of the legendary iceberg. Even in countries boasting a high standard of occupational safety, accidents at work still occur in mines on a daily basis, sometimes with a serious impact on health. On average over the last few years e.g. in Germany, approximately ten employees have been fatally injured each year due to accidents at work in the mining and the raw materials industries. No accurate statistics exist at an international level. However, the ILO estimates that more than 300,000 accidents

with a fatal outcome occur worldwide each year and that more than two million persons die as a result of occupational illnesses. As regards mining, an informed guess has been made that the risk of a fatal accident is about eight times greater than the number of jobs in this industrial sector would suggest. It is not just big mining operations that are affected in this case; it applies especially to mining by small and medium-sized companies, or illegal mining, which can still be found in many countries.

Should we come to terms with this situation by resorting to the saying: “You make an omelet without breaking eggs”? What conclusions can be drawn from this and, in particular, how can this situation be improved?

Prevention in mining = a humanitarian obligation for everyone

In the civilized world, we will certainly rapidly agree that there can be no discussion about whether we should preserve people's lives and health. It is the social and humanitarian duty of each decision-maker to do everything in his power to prevent accidents and sicknesses at work with every suitable means possible. This obligation falls in the first place upon employers, boards of directors and management at all levels of a company. The duty is also incumbent on so-called “stakeholders”, i.e. representatives of trade unions, governments and ministries, supervisory bodies, research and educational institutes and even every single employee in the mining sector.

Prevention in mining = a economic necessity at the same time

Thankfully, there is a growing widespread realization that it is not just a social duty to invest in safety but that it also makes essential economic sense. Pit closure, production downtimes, quality problems, enormous costs resulting from accidents, material damage, acceptance problems, shortage of skilled labour or the bad image of an individual company or the entire sector are only some of the catchphrases that could be mentioned here. The International Labour Organization (ILO) in Geneva works from an assumption that 4% of global economic activity, and as much as 10% in some countries, goes to waste on account of unsafe working conditions, accidents and sicknesses. Obviously reason enough to act now!

What do successful companies do differently?

The mining section of the International Social Security Association has, over the last few years, dealt intensively with the question of what recommendations can be given to ensure the occupational safety and protection of health of employees in mining. Within the context of this analysis, investigations were also conducted into what differentiates “safe” mining companies from “unsafe” ones.

The analysis results showed that successful approaches to systematic occupational safety work go far back in history. In 1799, Eleuthère Irénée du Pont boarded a ship for the crossing to the USA, where he settled in Wilmington, Delaware, not far from Philadelphia. In July 1802, he invested 36,000 dollars in founding a black powder manufactory employing 18 persons on the banks of the Brandywine River. DuPont gun powder opened up the way for roads and railway tracks and played an important part in the development and expansion of this still young USA. Early on, DuPont had to make the painful experience that the production of gun powder is not without danger. On 19th March 1818, an explosion destroyed a great deal of his premises. Friends of the company's founder were also amongst the 36 fatal casualties. As a consequence of this incident, DuPont anchored his pioneering safety philosophy – as it remains today – in the company's culture. One essential element was to oblige his managers to live up to their responsibility by ordering them to set up their houses on the firm's premises immediately adjacent to the powder mills – by today's terms, a drastic but effective measure. Other elements included setting down the first safety regulations and investing in safer products and safe production technology. DuPont could thus be considered to be the father of the Vision Zero strategy, which has set standards and still points the way forward today. Many other companies, even in mining, have in the meantime followed this example in prioritizing safety and health protection. They have proved that, with the right strategy and right measures, it is possible to reduce the number of accidents at work systematically and continually even in a business characterized by great risk potential. There are good examples of this in many countries, e.g. Canada, Chile or even Germany as well. In fact, RAG, a German anthracite coal mining company, is an outstanding example. Since the 1960s, the firm has been able to sink the number of

fatal accidents at work from several hundreds per year to zero and to decrease the accident rate to the current 4.1 officially reported occupational accidents per one million working hours. This means that German anthracite mining is considerably safer than the entire industrial economy in Germany (accident rate 15.5/1 million working hours) and the safest mining sector in the world. RAG's expertise is sought after internationally.

VISION ZERO. Safer Mining Worldwide!

The brand-new global prevention strategy from ISSA Mining

In 2012, the executive board of ISSA Mining came to a momentous decision based on many long years of experience in advising mining companies and multifaceted decision processes. The section's new global prevention strategy would be placed under the guiding principle of VISION ZERO. Safer Mining Worldwide! From this time onwards, all prevention offers and measures would be oriented towards this objective. The VISION ZERO. Safer Mining Worldwide! prevention strategy carries a clear message. It makes the assumption that, through taking suitable preventative measures in the mining and mineral extraction industries, a working world can be achieved, in which nobody is killed, falls gravely ill or is so seriously injured at work that their health is impaired for the rest of their life. VISION ZERO. Safer Mining Worldwide! does not mean "Zero risks at work". In work – especially mining – as in normal life itself, risks cannot be avoided. They must, however, be reduced by means of suitable measures to such a degree that injuries and illnesses can be avoided. Practice has shown that it is best to direct measures towards four fields of action in particular: "Safe and healthy technology", "Workplace design and environment", "Human competence and participation" and "Clear regulations". This orientation towards fatal or serious accidents does not mean that minor accidents or near-misses have been forgotten. It is rather that experience has demonstrated that these occurrences can also be influenced positively if preventative measures in a company are first concentrated on serious cases. The issue of prevention is thus given the necessary acceptance in this way and finds its way into daily business.

7 Golden Rules – accepted, tried and tested for implementation on the job

Shortly after VISION ZERO. Safer Mining Worldwide! was launched, inquiries were registered at our mining section concerning what course of action should be taken at operational level in order to attain the ambitious VISION ZERO goals. Any strategy is only as good as it is understood in a particular company, how it has been internalized by management and how it can be implemented "hands on" in daily business. Clearly understandable building blocks, which can be progressively enacted operationally, are necessary to this end. The final result of individual development steps and frequent coordination work with management and board representatives, mining experts and prevention specialists is a distillation with seven simple rules for implementing VISION ZERO. Safer Mining Worldwide! In the estimation of all stakeholders, these cover all facets of a successful prevention strategy and can be put into action in a business of any size – the 7 Golden Rules.

Golden Rule No. 1:

Make leadership commitment –show your colours!

This recommendation sets management under obligation. If the company or board of directors does not send clear signals as to what value is placed on health and safety at work in that company and what is expected not just from managers at all levels but from all employees, all other measures are a waste of time. It must become patently clear that safety is the moral duty of all persons and cannot be rated high enough as a company value. Nonetheless, ultimate responsibility remains with the board and management – it cannot be delegated to experts. It certainly makes sense to write down in the company's mission statement that, in case of doubt, safety has priority over production. But it is more meaningful to live this out in a credible manner. Safety should be the first item on the agenda at all meetings.

Top management must be conscious of its role model function, keep strictly to the rules and personally demand the same in the face of unsafe behaviour.

Golden Rule No. 2:

Identify all hazards and risks systematically!

At least two paths should be pursued in this connection. Firstly, it is apparent again and again that there are still many companies who have insufficient knowledge about the true state of incidents of illness and accidents at work. All incidents must be recorded and notified, even near-misses if possible, in order to exploit this information source in an optimum way. This also involves an investigation of the accident's true causes as well as a classification or comparison with other occasions.

The second facet of this rule concerns a comprehensive assessment of risk. This includes systematically and regularly determining all risks and hazards in their entirety, assessing their significance, laying down suitable control measures and monitoring their implementation and compliance. It is especially important to update this risk assessment regularly, to involve miners themselves and also to factor in soft issues, such as mental stresses and the like. The right order of precedence must be observed in selecting protection measures. It is better to eliminate a danger by changing working procedures or replacing a dangerous substance by a non-hazardous one than to stipulate the use of personal protection equipment for employees or taking up measures related to behaviour.

Golden Rule No. 3:

Create a safety improvement programme and set verifiable targets!

Just indiscriminately scattering measures around does not work. You have to choose emphases and set priorities in order to avoid wasting your investment. Integrating the employees themselves and the representatives of their interests in the process is crucial right from the start. The measures should bear the company's handwriting and be authentic. This makes them more credible and effective. As with all other rules, good, in-house communication is a significant factor in success. It has proved beneficial to embed prevention measures in company campaigns with recognition value. It is not necessary to painstakingly think up each new measure – working together with cooperation partners often facilitates the job, e.g. with the accident insurance company, industrial or trade associations.

Golden Rule No. 4:

Ensure that occupational safety measures are organized effectively!

As thorough research into causes shows that most accidents at work are not brought about by technical issues, but rather by organizational failures, clear organization is of great significance. Amongst other things, this includes issues such as delegating company obligations, clearly regulated spheres of responsibility, ensuring necessary competencies, regular discussions and instruction as regards safety, first aid in an emergency, safety concerns when purchasing new technology and involving outside or partner companies. Good documentation is especially important in this latter case. The best way is to establish a management system for safety at work and occasionally have its effectiveness examined by external auditing.

Golden Rule No. 5:

Use only safe and healthy technology!

Rule No. 5 concerns the area of "Safe and healthy machines, production plants, technical equipment, workplace design, and, of course, personal protective equipment" i.e. interactive prevention. The best course is to have already made provision for risks as regards occupational safety and health protection in planning and purchasing new plant. Risks should be avoided as far as possible by selecting suitable technology and providing for the needed safety from the outset. Order of precedence must be observed in selecting protection measures. Technical solutions are superior to organizational solutions. Personal measures, e.g. the provision of personal protective equipment, are the last means to be considered. Rule No. 5 also makes the assumption that compromises will occasionally have to be found with technical safety solutions, since they are often bound up with high investment costs. Compromises can, however, only be arrived at, if organizational or personal protection measures of equal value can be applied.

Golden Rule No. 6:

Ensure that employees are competent by investing in good training!

Safe technology on its own is ineffective unless employees are pulled on board and can participate. In the first instance for a mining company, this means being systematically involved in enhancing employees' qualifications and ensuring that required competencies – in work safety as well – are in existence, encouraged and receive further training. It is irresponsible, particularly in mining, to send miners down a pit, who have only learnt the job within the context of a short training session or who have received no instruction at all. Competence also means bothering systematically and continually about training employees further. Invest in your employees' competence – it pays off in every respect!

Golden Rule No. 7:

Invest systematically in staff participation and motivation!

Last but not least, a few words to Rule No. 7, which is certainly one of the most important and also concerns employees as well. When it comes to the matter of transforming lone wolves into a good team, of using each person's potential and developing awareness for safety at work, one of the most effective principles is "Participation"! Change those affected into participants! Delegate responsibility to individuals. Ask your employees for their ideas and observations. Your staff is often very well acquainted with critical situations and knows what is safe and unsafe. It is worthwhile unearthing this treasure. And that has a great deal to do with good leadership, good communication and a good company culture.

Conclusion and Outlook

In the intervening time, SAFETY 7:0, i.e. VISION ZERO and the 7 Golden Rules have been released for discussion on several continents within the context of advisory talks and conferences on safety. The strategy's clarity, plausibility and comprehensibility have reaped universal praise in respect of its safe mining concept and the convincing, well-structured package of measures. ISSA Mining can now offer comprehensive advice concerning VISION ZERO and the 7 Golden Rules for the section's members. The main features of VISION ZERO can be conveyed during a 3 day seminar. In addition, there is more detailed information available with recommendations for implementation, facts and good practice for each rule. Checklists and checkpoints facilitate systematic implementation.

Planning is in progress to develop indepth checks for simplifying each rule's operational implementation. These will be directed towards the small and medium-sized mining company target group in particular. On top of this, from 2015, regional conferences for VISION ZERO and the 7 Golden Rules are planned on various continents and will take place under the aegis of regional ISSA Mining representatives. It is particularly pleasing that the first employers' associations in the mining sector, for example the Chamber of Construction in Chile, have already taken the strategy on board for their own initiatives and that other ISSA sections have shown interest in VISION ZERO. Members of the Mining Section will discuss further implementation initiatives together within the framework of a strategy workshop on 28/29th August 2014 and decide on the section's new work schedule.

All this permits us to look positively ahead into the future. Our prime concern is to make it clear throughout the world that effective prevention is not just a social and humanitarian obligation. It is a sensible investment in the future of mining worldwide and crucial for the success of each individual company. In short, ZERO accidents – ZERO is possible!