

ATTRACTIVE WORKPLACES

Summary/purpose of the thematic area

To cope with the future labour supply, the mining industry must change the image of mining work and increase the attractiveness of working in the sector, especially for young women and men.. In the section Attractive workplaces, we describe a number of activities required in order to attract and keep skilled personnel in the mining industry in Sweden. To achieve this, the research agenda identifies five areas:

1. Digitalization opens up for new opportunities to create attractive workplaces in a safe environment, and jobs that provide space for the employee's full expertise and creativity. But there are also risks that need to be addressed, such as privacy issues, increased stress and work-life boundaries.
2. With the increased digitization, new qualifications are needed. These must be identified and programmes for reskilling and lifelong learning must be formed.
3. Research on health and safety has been successful, but the industry still needs innovative methods to control health and safety-related issues. To be perceived as a safe industry, a zero vision is required based on better proactive safety work.
4. Health and safety conditions for contractors must be explored and more inclusive safety cultures must be developed.
5. One overall thought in the agenda is to be proactive and to avoid creating problems in the first place. This is especially important in mining where initial mistakes can have consequences for a very long time.

Our ambition is to make the mining industry more prepared to meet the technological development on human terms. In a longer perspective, this can lead to the recognition of the mining industry as an ethical, ecological and diverse industry that can offer challenging jobs and attractive workplaces.

Objectives and KPI

The long-term vision (beyond 2045) is the zero-entry mine where all machines are self-regulated or remote-controlled from operations centres above ground. These centres are designed to promote co-operation and creative problem solving in multi-skilled teams of men and women. Basic safety level is not an issue anymore: dangerous work tasks are performed by robots.

In a shorter perspective, many workers remain underground. Here, there are new methods for iterative mine planning that take work environment and safety into account and reduce common initial design errors when mines are planned; production is organised through a holistic approach based on production teams and broad professional skills among management and miners; mining work has been transformed into being attractive to both women and men, not only because of the wages, but also because it is an interesting occupation with good potential for personal and professional development and lifelong learning in a safe and sound working environment. Still, a number of issues of attractive workplaces should be considered in future research and innovation as well; the most important are addressed below.

Research and innovation needs, strategies and actions

First, digitisation and its effects have an obvious place in a research agenda. Used correctly, digitalisation can create attractive jobs that provide space for the employee's full expertise and creativity. But there are also risks which need to be analysed and considered. Furthermore, competence development, learning at work etc. should be prioritized. These topics are vital in order to meet the demands of new technology and can guarantee flexibility for the company and development in one's professional role. Important focus areas for research are:

- How can the new roles of the operators (i.e. "Operator 4.0") meet the values and expectations that young women and men have when they enter work life?
- How can we increase safety by monitoring the operators in real time?
- How should digitised production systems address privacy issues?
- How to gain acceptance and avoid resistance for new technology?
- The identification of future skills requirements and education, as part of a lifelong learning?
- The development of new education programmes for reskilling and competence development of management and workers.

Health and safety at work must have top priority. Mechanisation, remote control and automation are efficient preventive safety measures. They are also appropriate for reducing workload to avoid musculoskeletal injuries and allow for recovery periods. Mining is characterised by huge investments and long-term operations. Thus, it is very important to have a well-designed physical production system. The personnel will have to live with the negative consequences of mistakes for many years. Improved safety is also a matter of a developed safety climate in the form of relevant education, rules and effective leadership, with safety prioritised in the day-to-day-work. In short, there is a need for further development of

- new methods for monitoring and controlling the work environment;
- efficient tools for proactive safety control, as well as broader analyses of the impact of digitalization on health and safety in general; and
- new iterative frameworks for the planning of attractive workplaces.

Moreover, the increased number of contractors must be addressed. Focus should be on the benefits and potential problems that come from a workforce of in-house personnel and contractors. This includes strengthening both formal (e.g. implementing joint safety management practices) and informal (e.g. communication and interaction in the workplace) relations in multi-employer worksites. Important issues in this area include:

- Reviews of the health and safety conditions for contractors in mining
- The development a safety culture that includes contractor

Finally, although the traditional image of mining is not particularly attractive and the industry still has health and safety issues that need to be considered, we think that it is possible to create a new vision of future mining - a vision of a high technology industry that speaks to today's young people. Mining companies must more actively demonstrate their social responsibility. Employees want to feel proud to work in the company, which means that issues such as vision, mission and core values are important. If we manage these problems well, they can be turned into advantages that create new, attractive job roles. All these factors affect the company's image, and thus the possibility of

recruiting young talented people to the industry. Overall, broader strategic research areas should include matters related to

- the development of a holistic concept for the zero entry mine;
- the development of efficient programmes for development of attractive societies;
- the development of a model for an ethical, ecological and diverse workplace and recognised as a green branch; and
- give the industry a new image that can attract young people.

Expected impact

Technical

- Digitalisation on human terms
- New methods for monitoring and controlling the work environment

Economical

- Reduced cost by keeping qualified miners and staff
- Increased efficiency at work

Social

- Increasing young people's interest in the mining industry.
- Contribute to the creation of an attractive society.
- Improved health and safety conditions in mining.
- A significant reduction in the number of severe and fatal accidents.
- A significant reduction in the number of occupational diseases.

Environmental

- Recognition of mining as an ethical, ecological and diverse workplace