



Autonomous Mining Skills Migration Case Study

CASE STUDY: TRANSITION FROM HAULAGE TECHNICIANS TO AUTONOMOUS CONTROLLERS AT VALE



Role and Skill Requirements

The role being transitioned was the Haulage Technician who would no longer be part of the new team organizational structure due to the introduction of the autonomous haulage system. The new role was Autonomous Controller, operating the system from the command centre.

Key Stakeholders

They key stakeholders were the Operations Manager and Supervisor. With the implementation of an autonomous haulage system, the Autonomous Controller position was upskilled from a previous role of Haulage Technician. While learned skills from the previous Haulage Technician position were transferrable and needed for the new role, a variety of completely new skills also had to be acquired and learned.

Change Management

First, several one-on-one interviews were completed to determine who was able and willing to be part of the upskilling and role changes. Following this, a change management consultant team helped to design and roll-out the new program. Feedback from Vale's personnel was provided throughout the process, and the final model is now in place and being applied to new projects.

Education and Training

For training, traditional methods were primarily used, but simulators were used to train the new elements of the role. Best results were found by using a combination of one-to-one theory followed by simulators, and—most importantly—on-site training.

Most of the trainers for the new role were from the system supplier but included lots of input from Vale personnel throughout the process allowed us to create a very particular role adapted to our conditions and operational culture.

Vale has a very well-established internal educational platform which includes a lot of lectures, courses, and procedures trainings that were used during this transition.

At this time, we do not use an external education system. A plan for next year is to involve the community schools and colleges—especially those near operational sites—with the technology topics. We are planning the format of this approach.



Autonomous Mining Skills Migration Case Study

Lessons Learned

The training process was very successful, and the program design met our expectations; that was a lesson learned and will be replicated.

Something that would be done differently (and had to be changed after a while) was the way the team the organizational structure was designed. Originally the Autonomous Team reported to the Mine Operational Leader, but this needed to be changed. An Autonomous Leadership was created to ensure the changes required for the autonomous systems were completed. The expectation is that those teams will soon be merged.

Final Notes

The development of autonomous haulage systems impacts the mining production chain in several ways. It is necessary to have an appropriate change management policy, and it is crucial to observe and gather all of the benefits brought by the technology. Change management is also necessary to guarantee the adaptability of the organization in the long term.

There are factors that can threaten the whole implementation autonomous haulage systems. Challenges that the Operation Team face are:

1. The adoption of autonomous technology
2. Required training paths to develop new roles
3. Procedures to deal with the sensitivity of the autonomous haulage system

Without the right approach to change management, companies will not achieve the new operational dynamics necessary to succeed. As a result, they will lose an opportunity to transform their operations into new model, which are safer, more consistent, and more productive.

About the GMG Autonomous Mining Skills Migration Case Study Project

To achieve the desired operating efficiency and productivity benefits of an autonomous operation, companies require resources with a different skillset than those which are required from the typical mining equipment operator. This project aims to develop case studies from organizations that have successfully implemented autonomous systems to help companies create a workforce that will enable autonomous mining.

Do you have a case study you would like to share? [Contact us.](#)

About GMG

The Global Mining Guidelines Group (GMG) is a network of representatives from mining companies, original equipment manufacturers (OEMs), original technology manufacturers (OTMs), research organizations, academia, regulatory agencies, consultancies, and industry associations who collaborate to tackle the challenges facing our industry. GMG aims to accelerate the improvement of mining performance, safety, and sustainability by creating guidelines and white papers that address common industry challenges, facilitating collaboration and expanding the industry's knowledge base. GMG also hosts and supports events that bring mining stakeholders together along with external industries to address the industry's challenges, successes, and innovations. Learn more about GMG at <https://gmgroup.org/>