

# Healthy Workplaces Good Practice Awards 2023–2025

## CASE STUDY



## State-of-the-art simulators for handling of machinery in underground mining

### ORGANISATION/COMPANY

Hellas Gold

### COUNTRY

Greece

### SECTOR

Mining

### TASKS

Specialised in the production of gold, silver, lead and zinc

### Introduction to the case study

Hellas Gold enhanced mining safety training by transforming an idle facility into a cutting-edge simulator centre. With state-of-the-art technology, operators master underground machinery in a risk-free, realistic environment – boosting safety, efficiency and productivity. By eliminating training accidents, improving mining safety, reducing equipment wear, and ensuring seamless mine operations during training, this initiative sets a new standard for experiential learning in high-risk operations.

## Background

Hellas Gold is a leading mining company based in Athens and employing over 2,300 people. It specialises in the production of gold, silver, lead and zinc. Since 2003, it has been developing and operating the Cassandra Mines in north-eastern Halkidiki, a site with a rich mining history spanning over 25 centuries. The company manages the three projects of the Cassandra Mines – Stratoni-Mavres Petres, Olympias and Skouries – prioritising responsible and sustainable mining practices.

Since 2012, Hellas Gold has been a subsidiary of Eldorado Gold Corporation, a Canadian mining company with over 25 years of global expertise in mineral exploration, development and operations.

Given the inherently high-risk nature of the mining industry, ensuring the safety and preparedness of underground workers is a top priority. Traditional on-the-ground training methods pose several challenges, including disruptions to mine operations since real equipment is used for training, limitations in covering a full range of potential emergency scenarios and exposure to real-world hazards.

## Aims

Hellas Gold aims to lead the way in mine operators' training, introducing innovative learning programmes to ensure a safe workplace for its workers.

## What was done and how?

- The company transformed part of its Madem Lakkos building facilities into a state-of-the-art training centre, repurposing the existing infrastructure that had been in care and maintenance since 2021.
- Hellas Gold introduced three high-tech simulators for underground heavy machinery operators, including simulators for load haul dumper and jumbo drill, plus a VR headset for spotting critical machinery errors.
- The company conducted a full 360° scanning and recording of Olympias underground mine tunnels to ensure workers are trained in real-world mining conditions. Based on this, it created an immersive training experience that mirrors the actual mine environment, including cockpit controls and equipment handling.

- The training programmes are organised in five-day sessions with a final general assessment. They are dedicated to three groups of mine operators: new hires with no previous experience, experienced new hires needing familiarisation with the company's machines and experienced operators undergoing refresher training to enhance safety and productivity.
- The training is also based on three key areas. The functionality part focuses on operating procedures, vehicle controls and obstacle avoidance. The safety area prepares operators to work safely under emergency situations, such as low visibility and high humidity. For optimised productivity, the training focuses on efficient equipment use to maximise output while preventing damage.



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## What was achieved?

- The company increased safety and reduced risks, with operators developing a strong occupational safety and health (OSH) culture applied daily.
- High-risk scenarios are simulated in a controlled, zero-risk environment.
- Hellas Gold improved emergency response and reduced traffic accidents.
- Trainees can identify and correct mistakes with trainer guidance. This leads to optimisation of operating skills, resulting in safer and more efficient performance.
- User-friendly training equipment makes learning more accessible.
- Since the simulators replicate actual mine equipment, there is a seamless transition from training to real operations.
- With the adopted technology, there are no major training location constraints, allowing flexible and convenient training sessions.

## Success factors

- Repurposing the Madem Lakkos facilities into a training centre optimised costs and maximised infrastructure utilisation.
- The introduction of state-of-the-art simulators and 360° mine scanning provided a realistic and immersive training experience.
- Since it does not require real machinery, the high-tech training programme ensures zero disruption to operations.
- The simulators ensure improved safety culture, with operators training in high-risk scenarios without real-world dangers.
- Reduced training, maintenance and accident-related expenses make the initiative a sustainable investment.

## Transferability

Hellas Gold's implementation of simulator-based training serves as a model that can be adapted across industries relying on heavy machinery and high-risk operations. By integrating immersive technology, empirical learning and risk-free skill development, this approach increases both safety and efficiency in a cost-effective and scalable manner. The key success factors – realistic simulation of work environments, zero-risk training, structured training programmes and zero disruption to operations – make it highly transferable to other mining sites, construction projects and industrial sectors.

## Costs and benefits

Hellas Gold's investment of around \$2.3 million in simulators has delivered significant cost savings and operational benefits. By shifting to simulator-based training, the company has reduced the expenses associated with traditional, on-site training, while ensuring that operators learn to use resources more efficiently.

One of the advantages is the increase in productivity. Operators refine their machine-handling skills through empirical training, maximising equipment efficiency. At the same time, the mine production cycle remains undisturbed, as no real machinery is required for training.

The programme has also led to lower maintenance costs. Operators become more aware of improper usage habits, reducing wear and tear on equipment once they return to the field. This proactive approach extends the lifespan of machinery and minimises unexpected breakdowns.

Finally, simulator training has enhanced workplace safety by eliminating training-related accidents and improving emergency preparedness. Operators gain hands-on experience in handling high-risk scenarios, leading to fewer incidents and safer working conditions across the mines.

## Key features of good practice example

- The use of state-of-the-art simulators for underground heavy machinery training provides realistic operational experiences.
- They offer hands-on, risk-free training with no impact on mine operations.
- The 360° virtual mine environment replicates real working conditions.
- This efficient solution reduces operational and maintenance costs.
- Targeted training services are provided for all experience levels.



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## Further information

Further information can be found at:

<https://www.hellas-gold.com/en>

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