

MINING

# DURANC AI-POWERED SURVEILLANCE FOR MINING



## BACKGROUND

Mines are prone to intrusion, theft, as well as health and safety risks, all of which can result in huge losses. An efficient warning system is crucial for security personnel to quickly detect suspicious or unauthorised individuals and vehicles before they ever reach the perimeter, thereby offering early intervention.

A smart surveillance solution is critical to monitoring all aspects of a mine by focusing on human and vehicle features.

Using deep learning algorithms, users benefit from the intelligent functions, simple configuration and inclusive solutions. This will transform regular monitoring to a whole new level.

A CCTV setup is the first step in addressing security issues at mines due to perimeter intrusion, theft and safety for employees and equipment. AI based smart surveillance solution allows users to reduce false alarms due to non-human or non-vehicle factors such as animals, weather and lighting



conditions throughout the mine. This helps to increase control room operator efficiency and productivity, ensure employee safety and streamline the health and safety reporting process.

## END TO END SURVEILLANCE SOLUTION

Duranc has created a surveillance solution that addresses security monitoring from the perimeter to the most sensitive areas of the mine.

### Perimeter protection

Protection on the perimeter of the mine includes:

- Intrusion detection through AI
- Realtime notifications to specific personnel
- AI solution supporting human and vehicle recognition, and metadata.

### Site-wide surveillance

No single part of the mine is vulnerable, with extensive and site-wide surveillance providing complete coverage through:

- High-resolution video surveillance and recording
- Duranc AI technology which reduces false alarms and enables intelligent searching

## Rugged solutions for a challenging environment

The mining space is faced by a number of ambient environmental and operational challenges:

- Stricter and evolving regulatory environment for security practices & reporting
- Difficult lighting conditions and network connectivity
- Explosion-proof and anti-corrosion camera options

## Entrance and exit

At both the perimeter and internal entrance and exit points, surveillance will assist in the following ways:

- Facial recognition and capturing image of everyone who enters the mine
- Automatic Number plate recognition to track all vehicular entry and exit
- Supports block listing & alarms

## Control center

The ability to view all cameras live as well as realtime alerts in a common venue is critical to allowing fast decision-making and response.

- Support of remote video surveillance, play back, event alerts etc

- Video wall support for several levels of video cascading.
- Powerful Duranc Vision VMS platform

## HOW WILL SURVEILLANCE SOLUTIONS BENEFIT MINING OPERATION?

With the ability to be rapidly deployed, Duranc Vision AI solution is designed to provide the safety, security and peace of mind required on a constantly altering mine site topography. Some of the tangible and intangible benefits offered by Duranc are:

- Agility
- Durability
- Flexibility
- Artificial Intelligence
- Manageability
- Reliability
- Scalability
- Security
- Real-time feedback

## TRENDS AND IMPLICATIONS THAT DRIVE INDUSTRY SECURITY

Increasing physical threats in the workplace

- Stricter and evolving regulatory environment for security practices & reporting

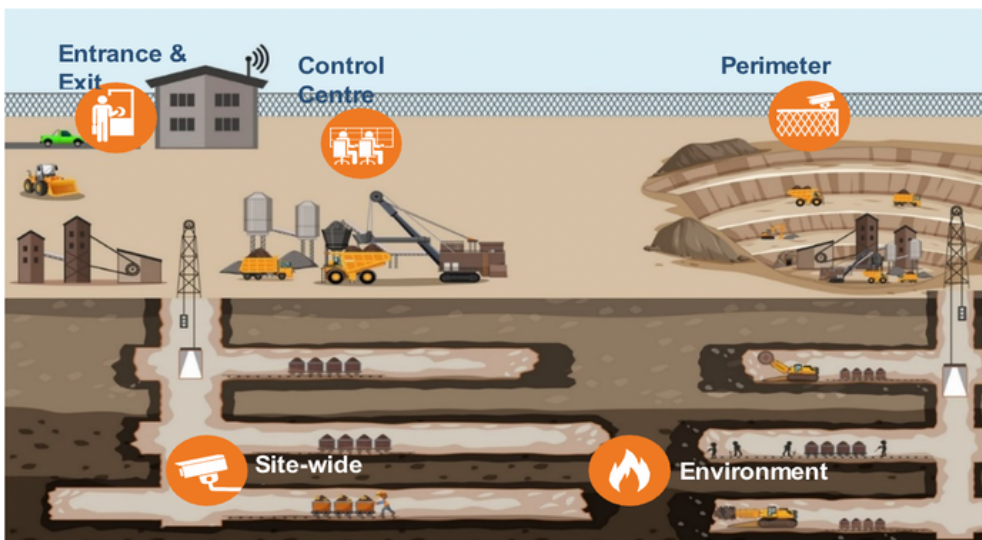
- Advanced Identity Management
- Convergence of IT and Physical Security
- Terrorist threats in high risk facilities

Simple perimeter alarms and barbed wire are no longer enough to protect critical infrastructure from unwanted access, vandalism etc. Interior monitoring is becoming more important in providing a complete security system in mining environments. Cameras monitor access points along with activity inside the mine. The Duranc Vision takes the camera feed and records in a centralised location on the cloud which enables remote monitoring from anywhere. Security personnel can monitor all the feeds simultaneously for a complete visibility of the entire mine.

The main areas of mining are covered by Video surveillance:

### Highest security in the red area:

The most secured area within a mine is the so-called red area. This is where the mined material is sorted. The cameras must produce high-quality and detailed images. Also, it is crucial that the recording devices record with a high frame-rate and resolution. On top of that, large machinery and numerous floodlights mostly create difficult lighting conditions. Good quality IP cameras are able to cope with the difficult conditions in mines. They provide clear and detailed images without any blooming or smearing, even against backlighting and under constantly changing lighting conditions. Furthermore, vandal-resistant variants, which are extremely robust and resistant, are available.



Continuous recording must be ensured throughout the “red area”. In order to guarantee the high availability of the recording, Duranc Vision provides cloud based centralised storage. Which enables remote monitoring through a single window. To increase failure safety, a gateway can be provided to record locally in case of network failure, and upload whenever network is re-established.

#### **Suitable solutions for all areas: Search Lanes**

Duranc Vision enables the customer to monitor the entire mining operation. Most mines have strict access regulations and procedures for both product and materials of value.

Passing to and from sensitive areas mine workers have to go through random searches, all these search lanes are monitored by high-resolution cameras, whereby high-quality audio recordings are also made. This is done in order to monitor the search processes and identify any incidents between the security personnel and the mine workers.

#### **Process Monitoring**

Furthermore CCTV is widely used in monitoring the various processes in the refinery area. This area is hazardous and requires an eye on the operation should any problems occur from an automation point of view. Typical applications include furnaces, conveyor belts and grinding machinery.

#### **Mining Perimeters**

Anyone entering the outdoor area of the mine, the so-called “green area” is already watched by cameras. In that area the focus is on a general surveillance, covering safety and security.

#### **Safety at work and confirmability of damage events**

Using state-of-the-art video surveillance technology, it is easy to monitor whether safety regulations at work are adhered to. It can be quickly checked, for example, if all employees who work with high-temperature machinery, always wear specific mandatory garments. Moreover, very expensive, high-performance machines are used in mines. In the case of an accident such as an explosion, the recorded image data allow for a fast and straightforward investigation of the cause of the malfunction.

#### **Future-ready**

An exchange of existing systems or a migration to an IP solution can also be made gradually so that the video security system can be adjusted to individual requirements and available budgets. At customer's request, a new system can be operated alongside the existing installation in order to train operators on the novel system. During the commissioning of a new system, it is ensured that the continuous recording carries on without interruptions.

#### **Duranc Vision:**

- Duranc Vision provides following intelligent video analytics based on Computer Vision and Machine Learning.
- **Intelligent Analytics:** Video analytics involves detecting and tracking motion of objects. It can identify specific conditions and alert mine operators of potential situations.
- **Directional Motion:** Generates an alarm in an area when a person or object moves in a user-specified direction. Cameras can detect vehicles / personnel moving in the opposite direction of the normal flow of traffic or an individual entering through an exit door.

- **Object Removal:** Triggers an alarm if an object is removed from its position. Ideal for customers who want to detect the removal of high value or critical objects.
- **Object Counting:** Counts the number of objects that enter a defined zone or cross a tripwire. Used to count the number of people entering/exiting the premises.
- **Camera Sabotage:** Detects large changes in the field of view. Alarm generated on significant shift in camera view such as lens cover or camera repositioning.
- **Abandoned Object:** Detects objects abandoned in user-defined zone.
- **Loitering Detection:** Detects people or vehicles in a zone longer than the user-defined time allows. Effective in real-time notification of suspicious behaviour around hazardous areas / critical infrastructure.
- **Stopped Vehicle:** Detects vehicles stopped near a sensitive area longer than the user-defined time allows. Ideal for mining hazardous areas, and vehicles waiting at gates.
- **Video Management Systems:** Purpose-Built for HD Video. Mission-Critical Reliability and Performance. Scalable to Hundreds or Thousands of Cameras. Open-Platform, Foundational Architecture. Third-Party Cameras
- **Mobile access to security video:** For first responders & roving security personnel. View live video from IP cameras via video management system. Control Pan Tilt Zoom cameras.