

NVI SOLUTIONS

AI-powered video analytics systems
for oil & gas and industrial safety
and efficiency

NVI group of companies

Business oversight in numbers

NVI SOLUTIONS

Integration

Deployment

Service

- Over 7 years of expertise
- Over 300 employees
- Over 200 service technicians
- Over 50 oil & gas experts
- 8 strategic consulting experts

NVI RESEARCH

Research

Development

Adaptation

- Over 40 engineers and scientists
- Over 200 scientific publications
- 6 PhD candidates
- 2 doctors of science
- 2 own hosted scientific conferences

Strategic markets

- Oil & gas
- Energy
- Manufacturing
- Construction
- Logistics



Own AI data synthesis lab



- R&D, development of new markers
- Generation of synthetic datasets for AI training
- Intelligent data pre-labeling system

Impact of the human factor on industrial safety

NVI Solutions' customer pre-survey

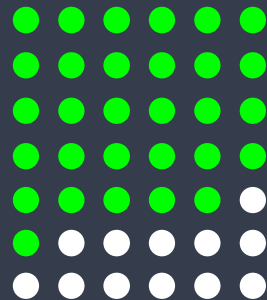
Proactive indicators

Industrial safety requirements that depend on individual human actions are currently met in **only 77% of cases**



Reactive indicators

72% of major incidents in 2022–2024 occurred, among other reasons, due to incorrect actions or inaction by people.



Key complicating factors

- Labor market **talent shortage**
- Rising **staff turnover** among contractors
- Declining **competency levels** of newly engaged personnel
- Mostly **episodic and delayed** personnel interventions
- Lack of **incidents verification** organizational processes
- Shortage of **human resource** for safety monitoring and control



One of the most common and difficult problems to solve is the **lack of information** needed to form an **objective picture** of industrial safety performance

Work oversite automation with AI-driven solutions

Digital solutions as key technology to strengthen performance monitoring

Current coverage:
Under 1% of all works

Work oversight
by human



Target coverage:
100% of all works 24/7

Work oversight by
AI-driven solution



Outcome and effects

**Automated work oversight
for precise HSE monitoring**

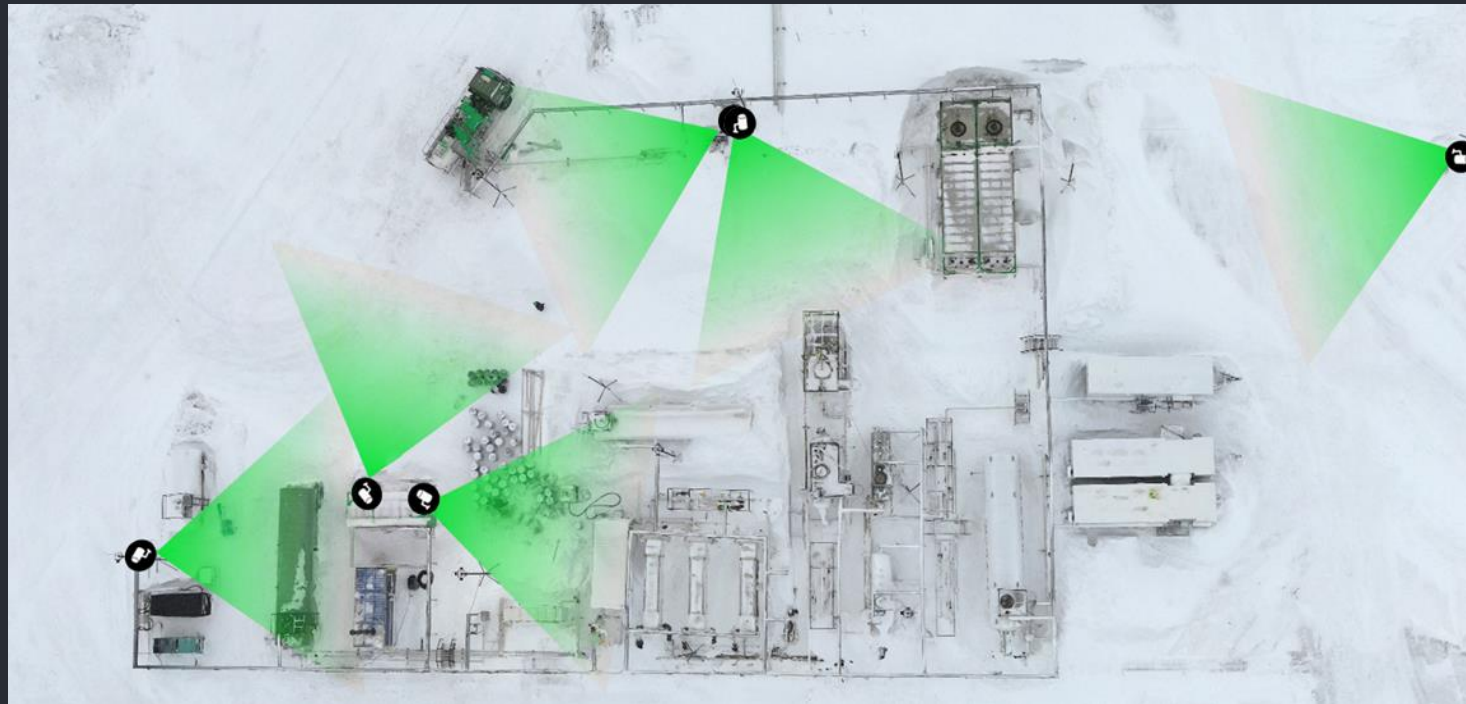
- Increasing the coverage of independent oversight from under 1% to **100%**
- Ensuring **24/7** coverage of all works
- Gaining information that enables an **objective view** of HSE performance
- Driving **systematic and immediate** actions within personnel interventions

Operation of AI-powered video analytics systems

Scenario-based solution for providing customers with objective information



AI-powered industrial video analytics system uses pre-designed neural classifiers and complete scenarios to compare objects and actions from video stream with pre-defined patterns and alert if any unwanted deviations are present



Main operation stages



Camera

The camera continuously captures what is happening at the site.



AI video analytics

Continuously analyzes the video stream and compares the current situation with predefined safe-behavior patterns.



On-site alerts (PA)

Notifies the worker via loudspeaker about unsafe task execution



Notifications

Notifies the person responsible for safe operations about the detected violation

NVI Solutions AI-powered video analytics solution

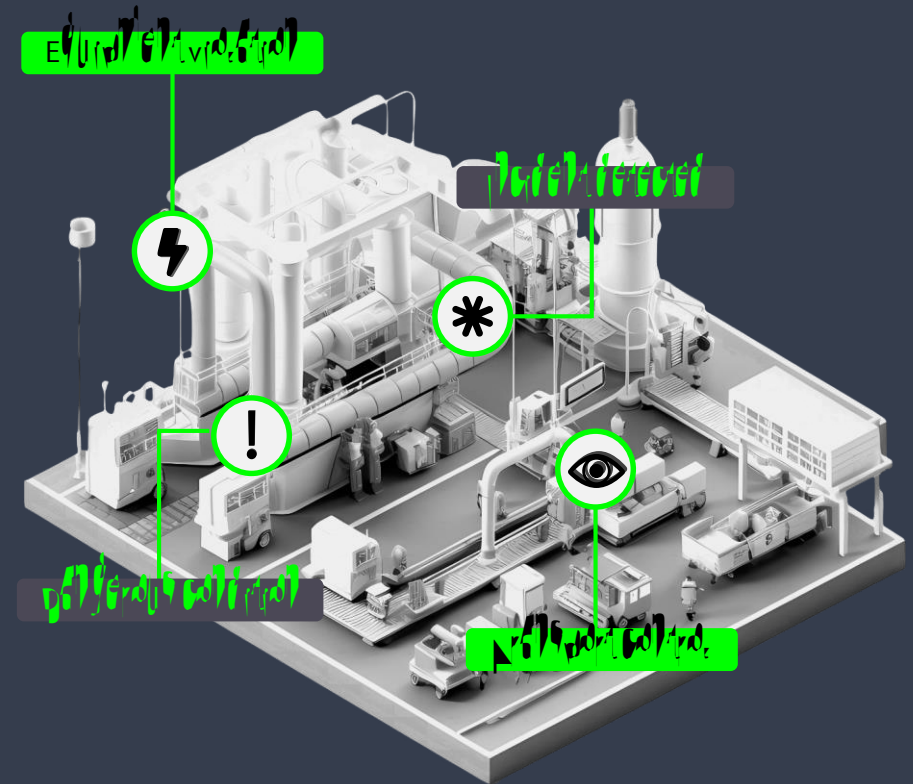
What we offer for industrial safety and efficiency

We transform video monitoring to supervision - owl.Guard AI solution

- **Sees everything** that happens on the production site in real time and with high detalization
- Recognizes **complex situations** that occur within the facilities
- Works effectively in **real industrial environments**
- Has **high computational performance** and **scalability**, does not require large capacities and works on-premise
- Is **integratable** to other production systems to expand technological capabilities
- **Globally scaled**: over 17 years of video streaming processing daily

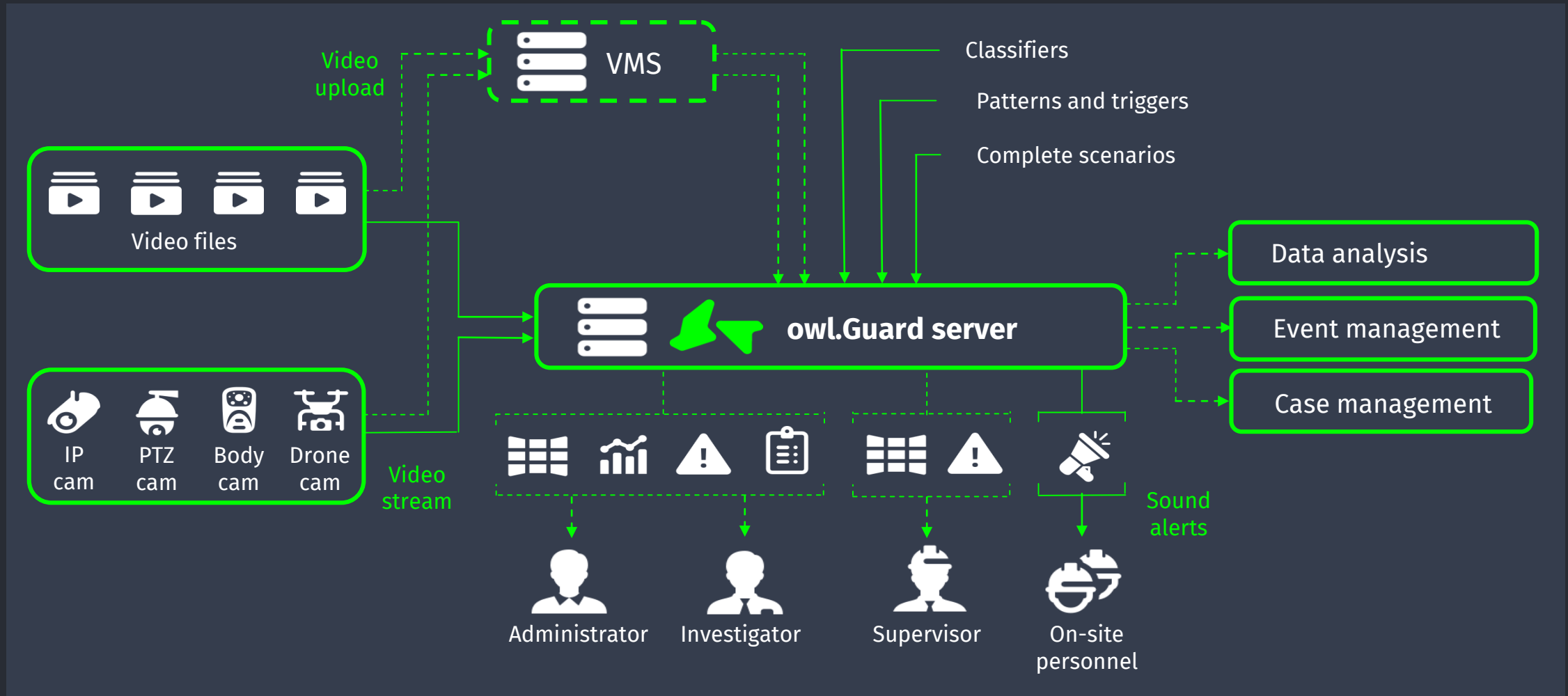
System capabilities today

- More than **25 000 video analytics events** per day
- More than **3 000 video surveillance events** per day
- More than **17 years of video streaming** in daily processing (24 / 7 / 365 operation)



NVI Solutions AI-powered video analytics solution

Functional diagram of typical solution deployment on site



NVI Solutions AI-powered video analytics solution

Some of pre-designed classifiers

● People

- Skeletal tracking
- Body parts
- Body alignment
- Typical actions
- Untypical actions
- Immobility

● Transport

- Cars
- Trucks
- Trains
- Ships
- Specialized vehicles
- Vehicle plate numbers
- Direction
- Alignment
- Route tracking

● PPE

- Hard hat
- Safety glasses
- Respirator
- Face shield
- Face mask
- Safety jacket
- Safety pants
- Signal vest
- Gloves
- Safety harness
- Bare forearms

● Zones

- Personnel work area zones
- Equipment operation zones
- Entrance zones
- Common areas

● Equipment

- Equipment
- Equipment parts
- Position
- Orientation
- Alignment

● Anomalies

- Fire
- Smoke
- Vapor
- Leaks
- Leak traces
- Smoking

● Objects

- Unclassified objects
- Mobile phones



Composition of AI classifiers and pre-configured **patterns and triggers** are the engine for video analytics systems operation and its' effectiveness

NVI Solutions AI-powered video analytics solution

Complete scenarios



Over 150 pre-configured complete scenarios are ready to be deployed to different types of sites without long adaptation and development period

● HSE compliance control

- A person climbed to a height of more than 1.8 meters, on a balcony without a safety harness
- An employee bends over the handrails
- Finding people in the danger zone on the walkway when lowering and lifting a pipe
- A person being closer than 2 meters to the edge of the rotor platform

Effect metrics

- Improving work oversight quality (rate of registered incidents)
- Lowering HSE incidents number
- Lowering FAR, AAR, LTIF

● Operations control

- Recording personnel movement on site
- Determination of presence/absence of personnel, counting them
- Control of access of unauthorized personnel to operating equipment
- Vehicle control at checkpoints
- Control of the sequence of technological operations during repair works execution

Effect metrics

- Reduction of operating costs
- Optimization of inefficient processes
- Efficient use of human and equipment resources

● Equipment control

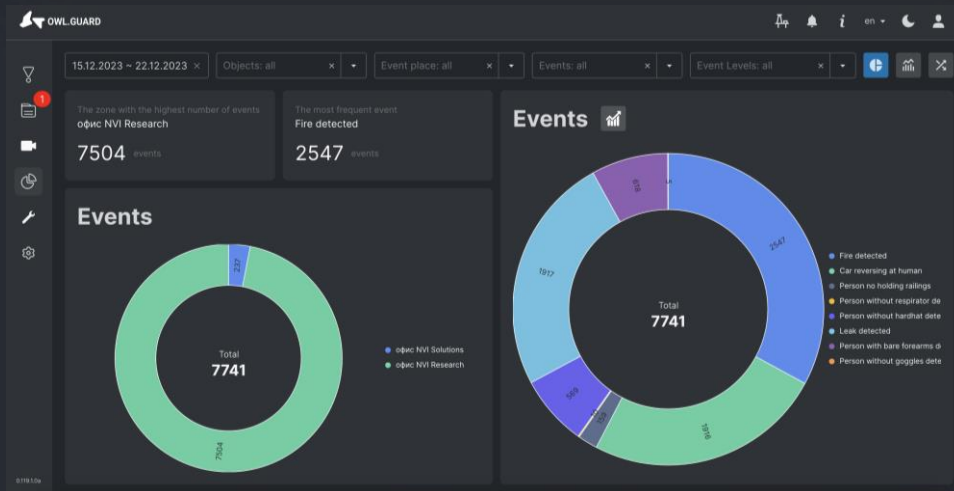
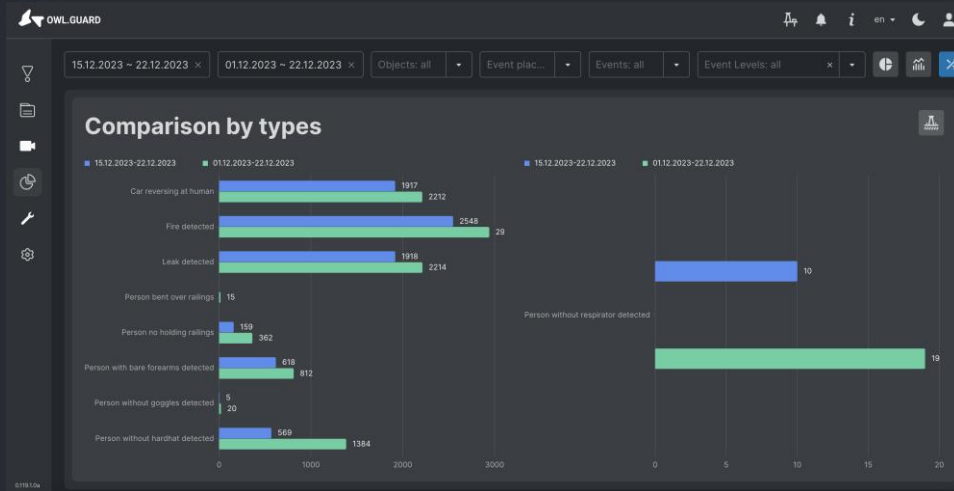
- Identification/recognition of equipment its' elements
- Location of closed and open switchgears (closed switchgear, outdoor switchgear)
- Detection of sparking contacts, critical heating of contacts (temperature control chamber), destruction of insulator, cable breakage, fire during short circuit

Effect metrics

- Reduction of equipment repair time and costs through rapid incident response
- Reduced losses and environmental risks through reduced incident detection and response time

NVI Solutions AI-powered video analytics solution

Platform **owl.Guard** to track key monitoring data



Monitoring and control platform owl.Guard makes easy to maintain work oversight within one or more production facilities with focus on key metrics indication

Key features

- Easy to use interface with detailed overview
- Monitoring and control 24/7/365
- Pop-up and e-mail notifications in real-time
- Regular and manual reports
- Dashboards and advanced statistics
- Event log with adaptive filters and search engine
- Video upload and case investigation
- Incidents validation feature
- Possibility for integration with VMS, PA, APCS, IoT systems

NVI Solutions AI-powered video analytics solution

Hybrid retrospective video oversight by NVI Solutions

Video recording

- Video recording of high-risk operations is in place
- Video recordings are **stored and transferred** for analysis

AI-powered analysis of stored recordings

Automatic violation Detection by owl.Guard

Examples of use cases for detection:

- Supervisor leaving the work area
- Unauthorized crew assembly
- Missing pre-job briefing
- No on-site handover performed

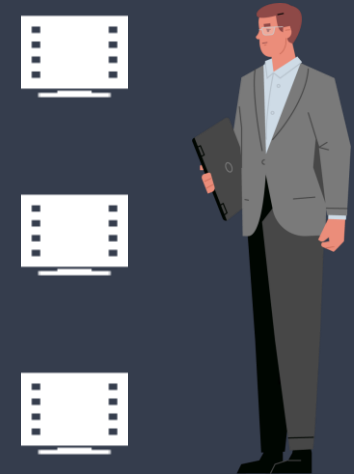
Removing ineffective data from analysis by owl.FlowVision

Skipping or fast-forwarding video segments where violations are not possible:

- No activity recorded
- Repetitive actions



Human analysis and consolidation



Hybrid retrospective video analytics give opportunity to utilize all owl.Guard functionality for facilities without connection to internet or without supervisors

NVI Solutions AI-powered video analytics solution

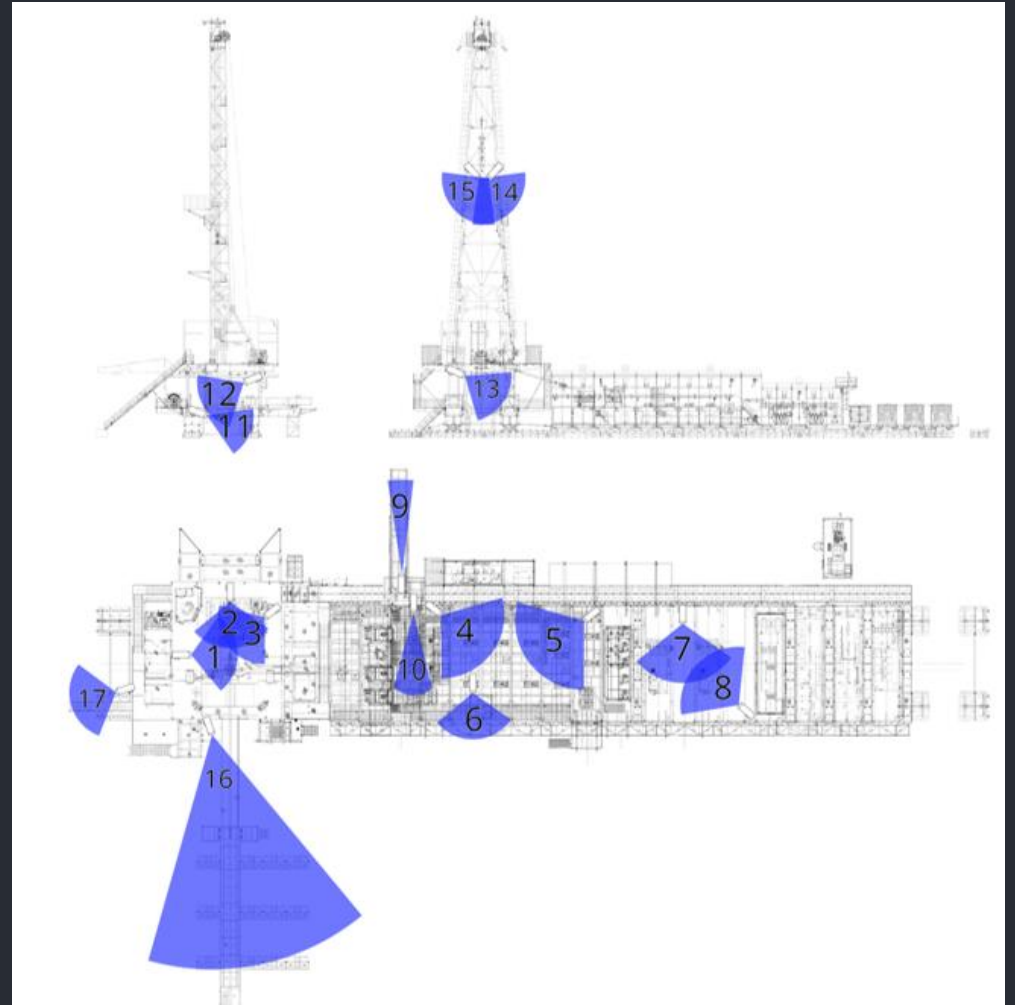
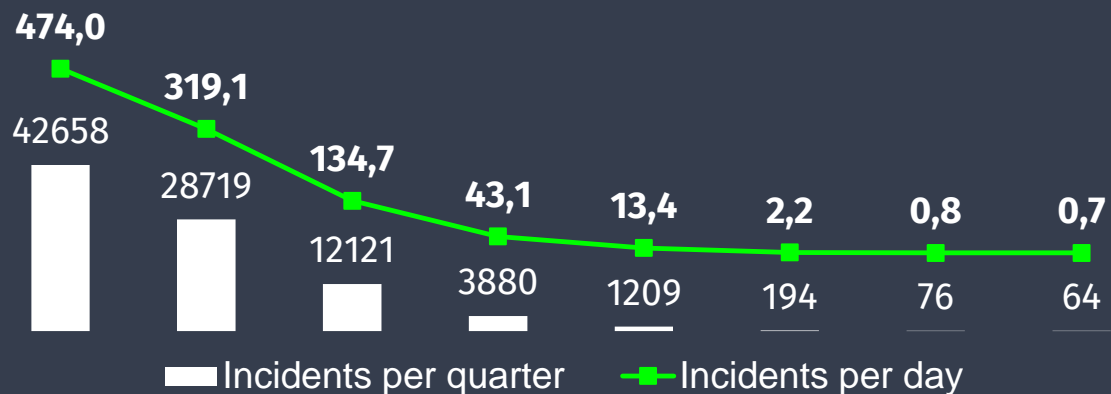
Use case: oil & gas drilling operations

Solution deployed

- Autonomous **owl.Guard** platform with **36 recognition scenarios**
- Infrastructure for platform and data storage
- **17 camera units** for each drilling rig
- Sound alarm system
- Service support on site

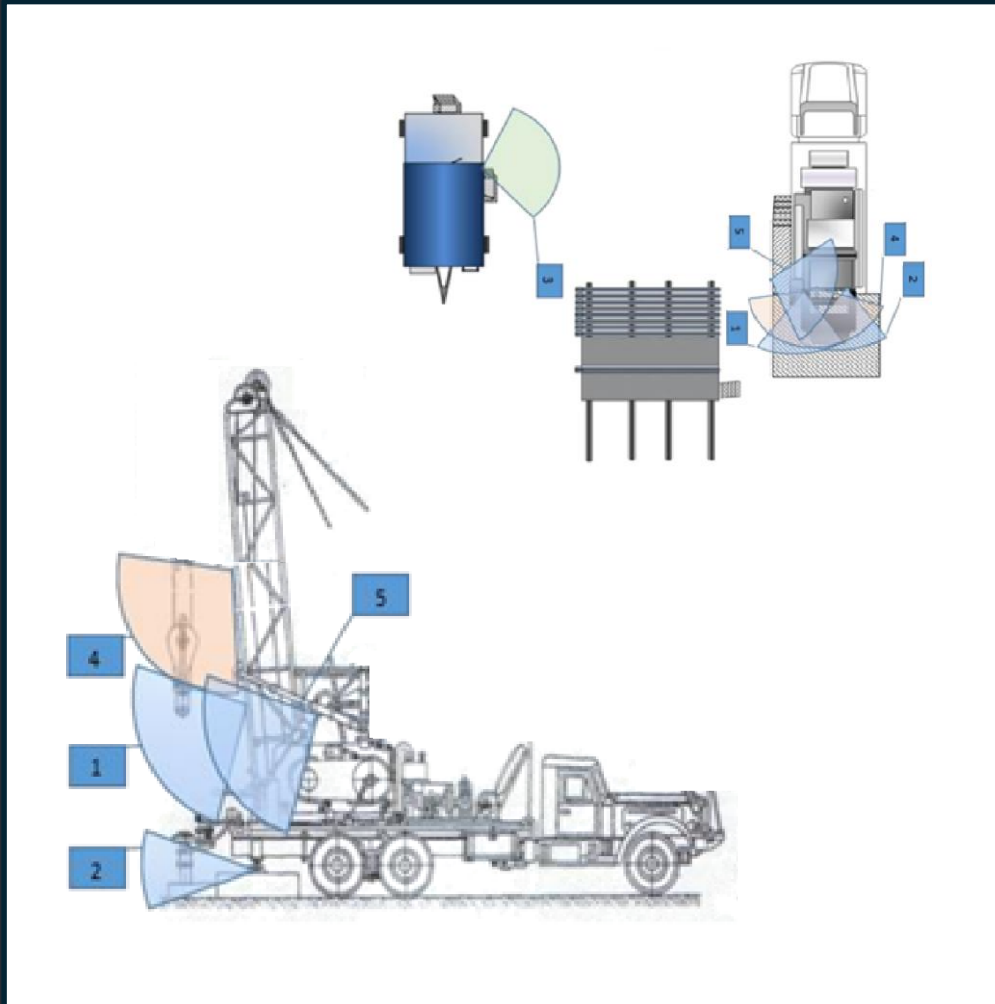
Results after 2 years of use

Whole number of safety violations reduced **by 600 times**



NVI Solutions AI-powered video analytics solution

Use case: oil & gas wellpads workover

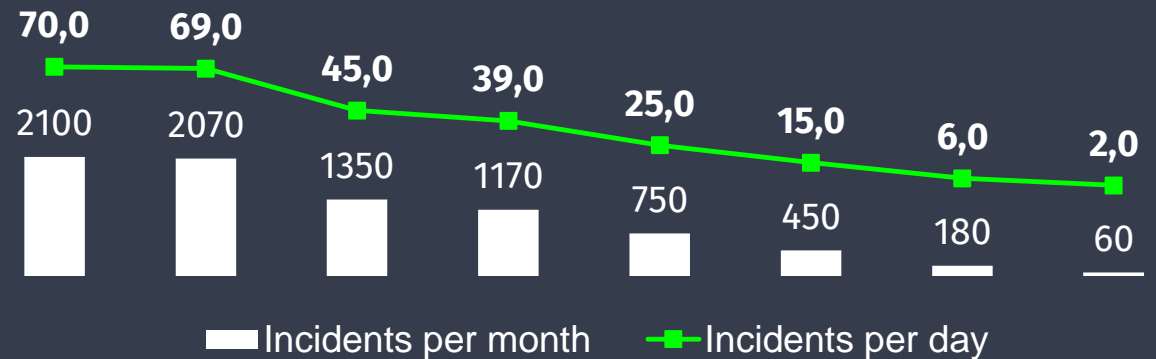


Solution deployed

- Autonomous **owl.Guard** platform with **28 recognition scenarios**
- Infrastructure for platform and data storage
- **5 camera units** for each drilling rig
- Sound alarm system
- Service support on site

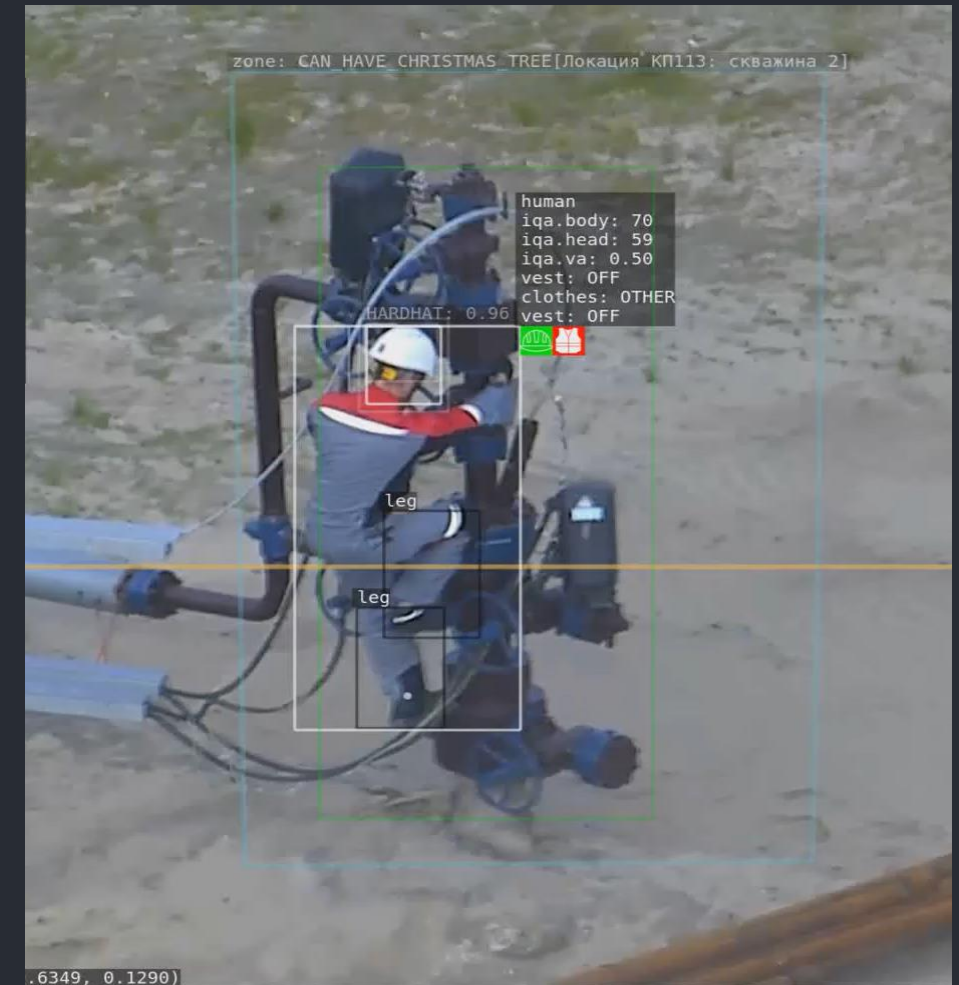
Results after 2 months of use

Whole number of safety violations reduced **by 35 times**



NVI Solutions AI-powered video analytics solution

Recognition demonstration



NVI Solutions AI-powered video analytics solution

Recognition demonstration



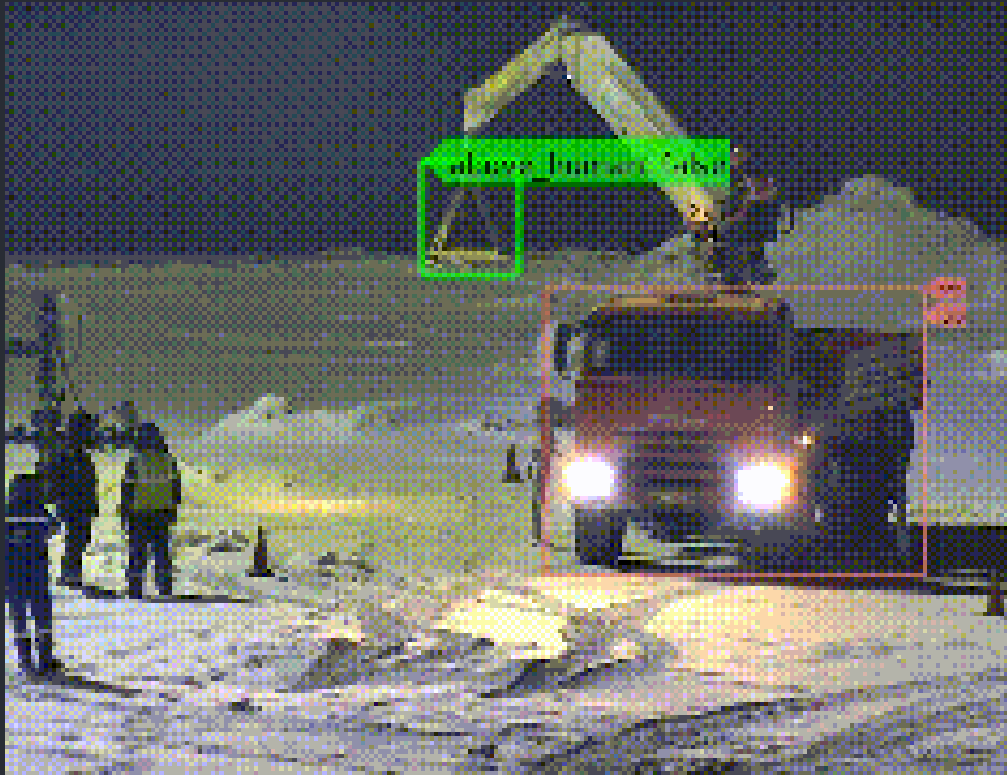
NVI Solutions AI-powered video analytics solution

Recognition demonstration



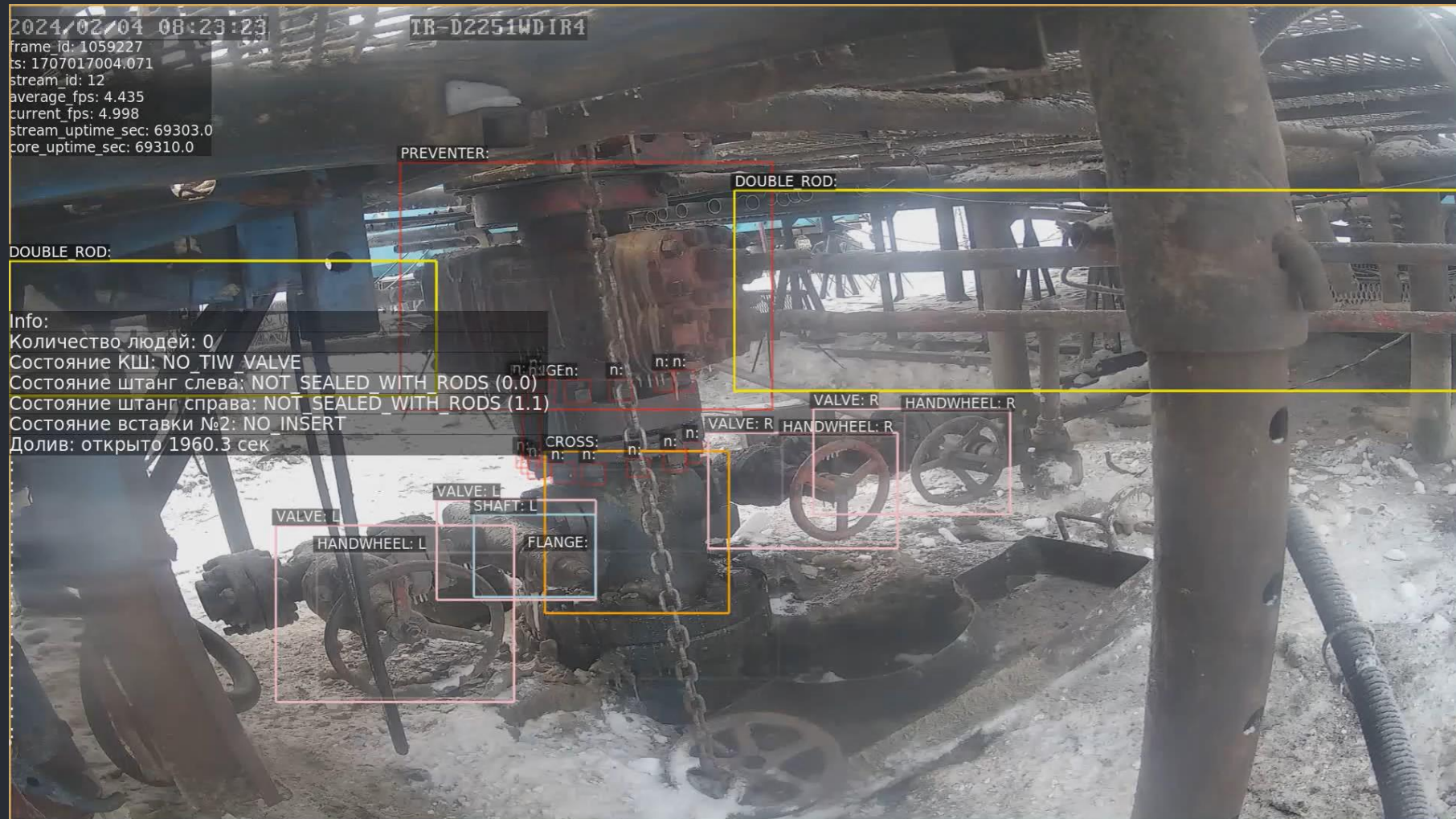
NVI Solutions AI-powered video analytics solution

Recognition demonstration



NVI Solutions AI-powered video analytics solution

Recognition demonstration



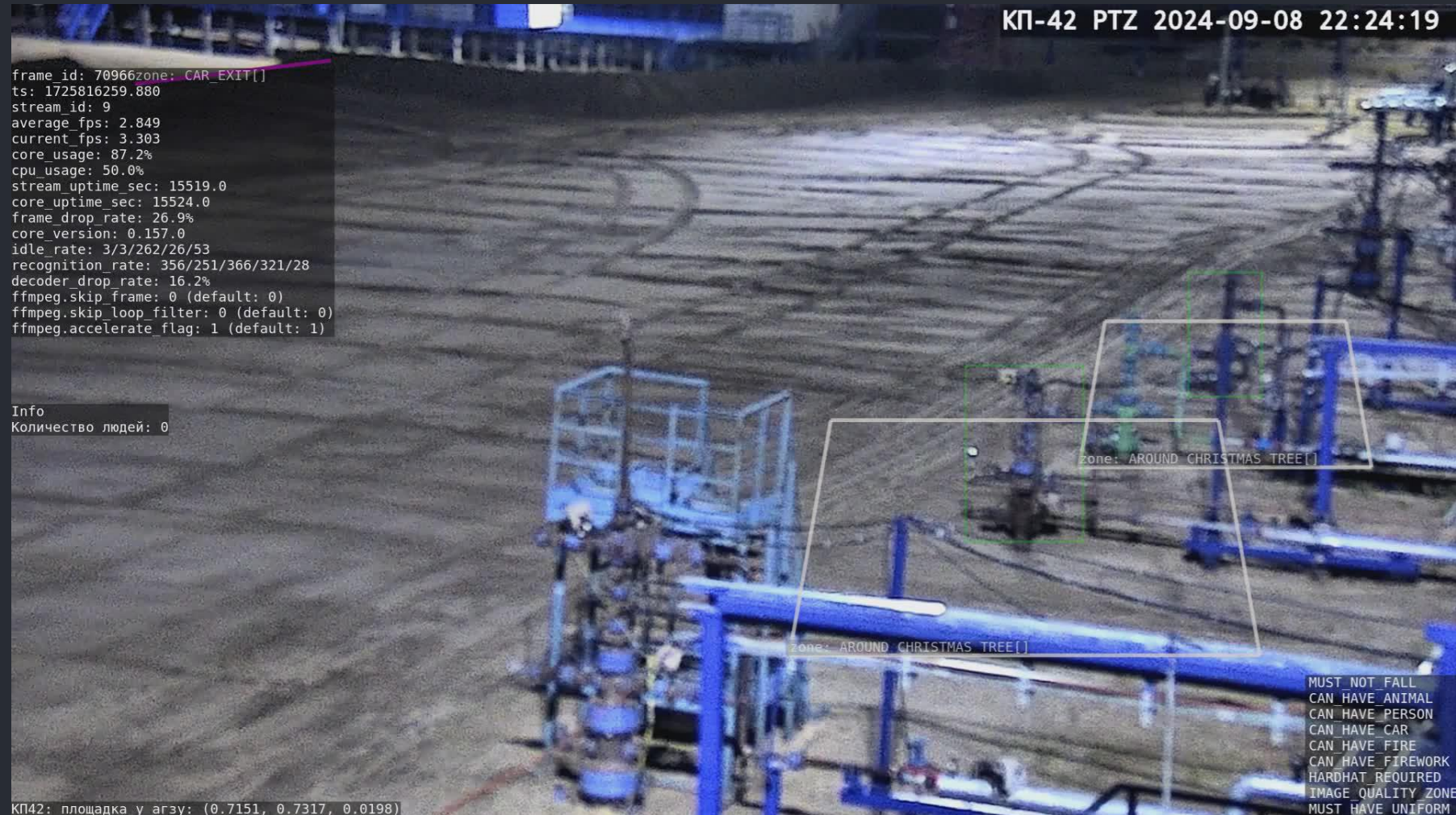
NVI Solutions AI-powered video analytics solution

Recognition demonstration



NVI Solutions AI-powered video analytics solution

Recognition demonstration



Thank you for your attention!
Let's discuss your company needs



Ivan Dukach

Senior international
sales manager

+7 (916) 806-59-96
ivan.dukach@nvi-solutions.com



info@nvi-solutions.com
www.nvi-solutions.com

