«Siberian Coal Energy Company»

Efficient management of mine safety as an element of national economy stability

SUEK's mine safety management system and introduction of Mutlifunction safety systems for the purposes of remote mining operations safety parameters monitoring

WWW.SUEK.RU

Moscow, November 2015

SUEK's assets related to coal and logistics

Krasnoyarsk region

- Production – 27.0 Mt
- Three surface mines

Zabaikalye region

- Production – 5.0 Mt
- Three surface mines (including Apsatsky 1.0 Mt).

Khabarovsk region

- Production – 5.4 Mt
- One underground mine
- Two surface mines
- One processing unit
- One processing plant

Ports and railway assets

- Vanino Bulk Terminal (16.8 Mt)
- Murmansk commercial seaport (13.1 Mt)
- Maly port (2.2 Mt)
- Around 3000 rail cars owned, and 16000 cars used in total

SUEK today:

- Lading coal producing Company in Russia, and one of the major International exporters
- Constantly listed in top-10 world's leading coal producers
- World-class coal assets – 18 surface mines and 12 underground operations in 7 regions of Russia
- Well-developed port, transportation and auxiliary infrastructure
- Over 30,000 employees

Kemerovo region

- Production 33.1 Mt
- 9 underground mines
- Three surface mines
- Four processing plants

Khakasia region

- Production 11.7 Mt
- One underground mine
- Three surface mines
- One processing plant

Buryatia region

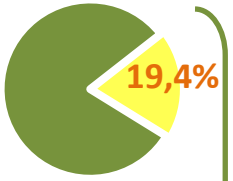
- Production 13.2 Mt
- Two surface mines
- One processing plant

Primorye region

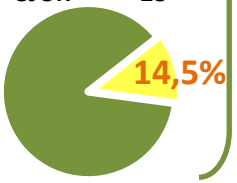
- Production 3.5 Mt
- One underground mine
- Two surface mines
- One processing unit

SUEK in Russia:

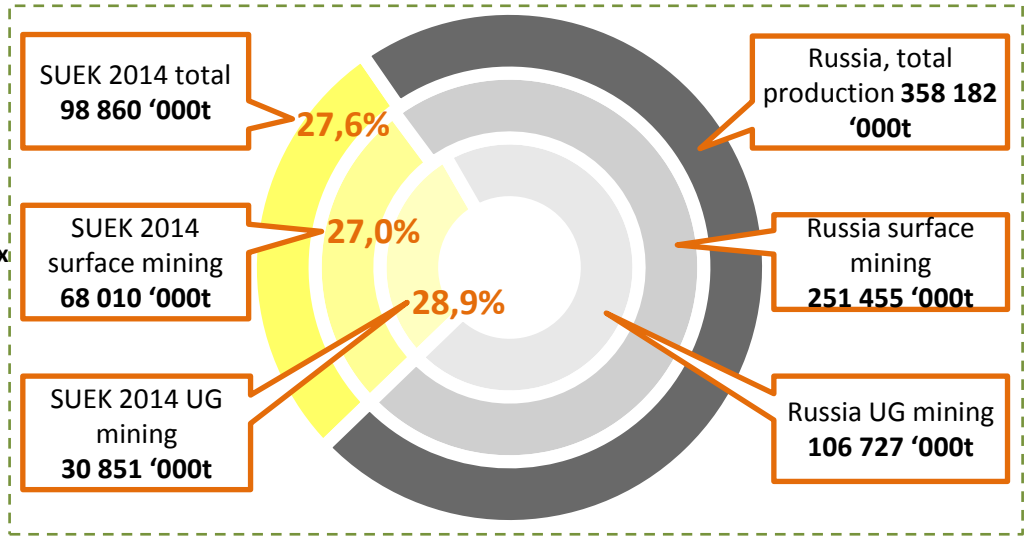
Major manning
Russia - 148 321
SUEK - 28 705



Количество добычных предприятий:
Россия - 193
СУЭК - 28

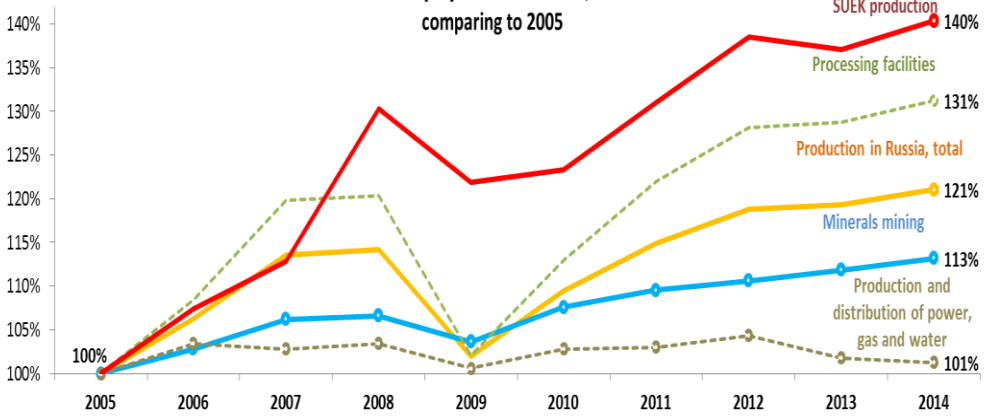


SUEK in 2014 – 27.6% the total coal produced in Russia



Coal production in 2014 by various companies (Mt)

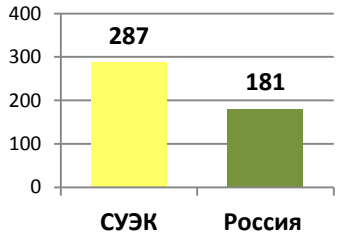
Product's physical volumes, Russia comparing to 2005



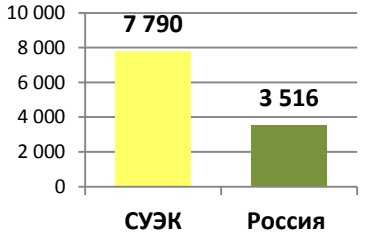
In terms of increase of production since 2005 SUEK is 19% ahead of the Russian industry.

SUEK vs Russian coal companies in 2014

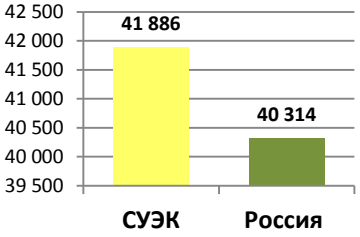
Labor productivity t/man/month



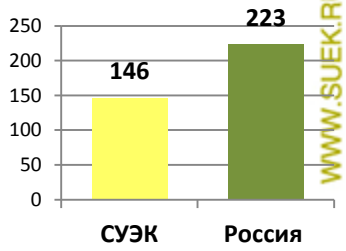
Production rate in 1 face (KMZ), t/day



Average salary, RUB.

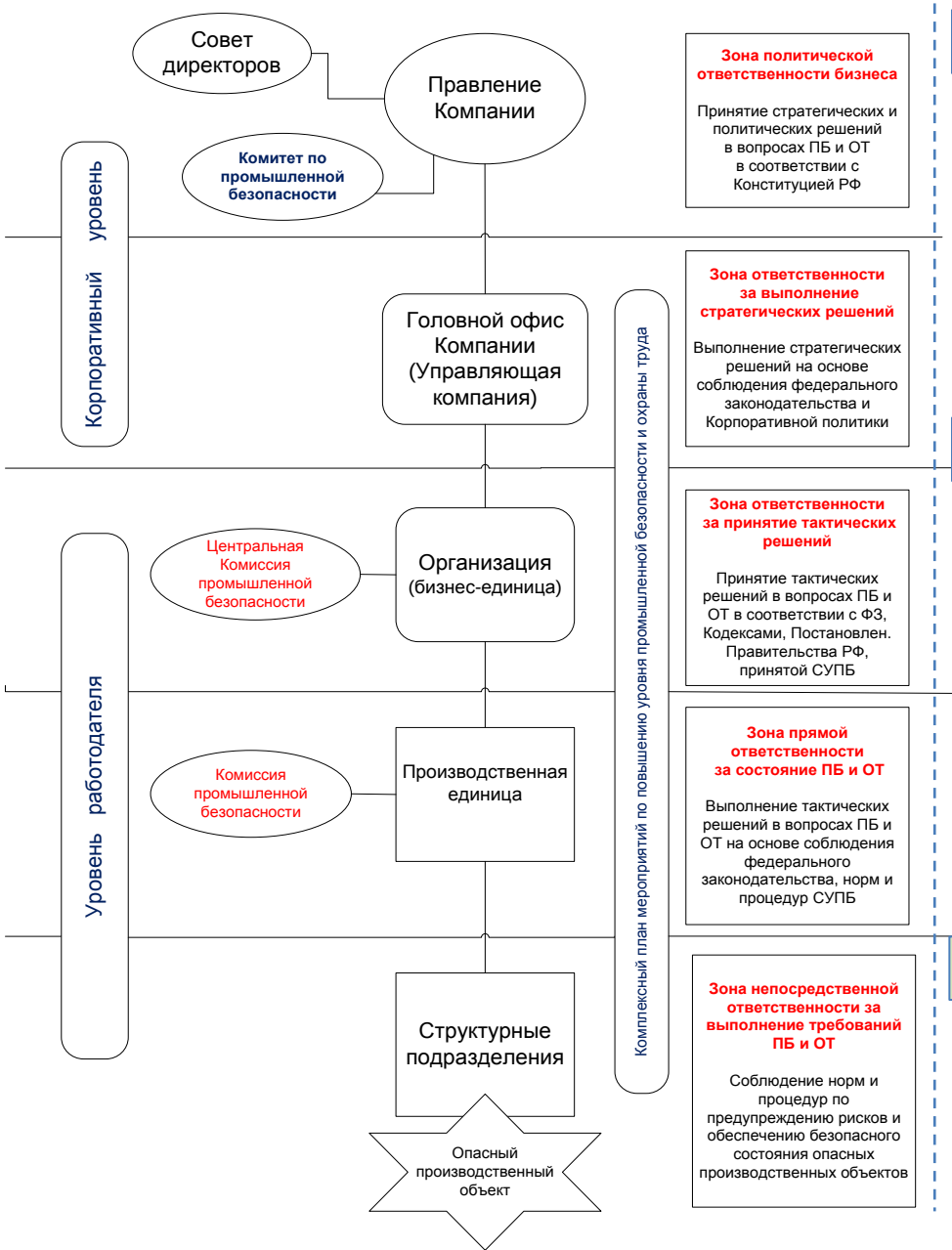


Salary fund vs production ratio RUB/t



SUEK. SAFETY, Health and safety management system

Corporate structure in charge of H&S management



Safety culture structure

Commitment at political level:

- Announcement on the safety policy
- Management structures
- Resources

Commitment at management level:

- Establishing of responsibility
- Establishing and control of safety practical provision
- Qualification and training
- Encouragement and punishment
- Reconciliation, analytical overview and comparison

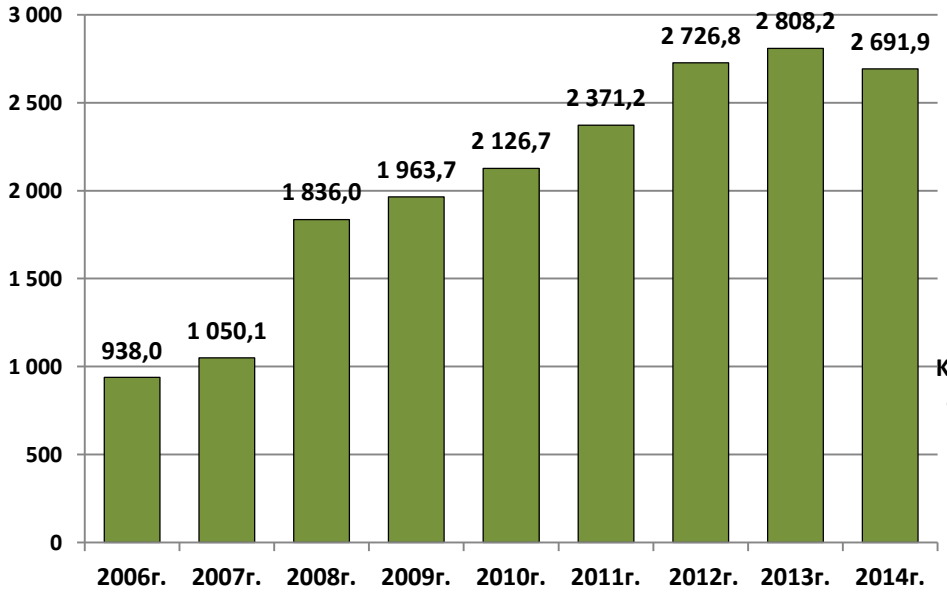
Commitment at individual level:

- Strictly specified and balanced approach

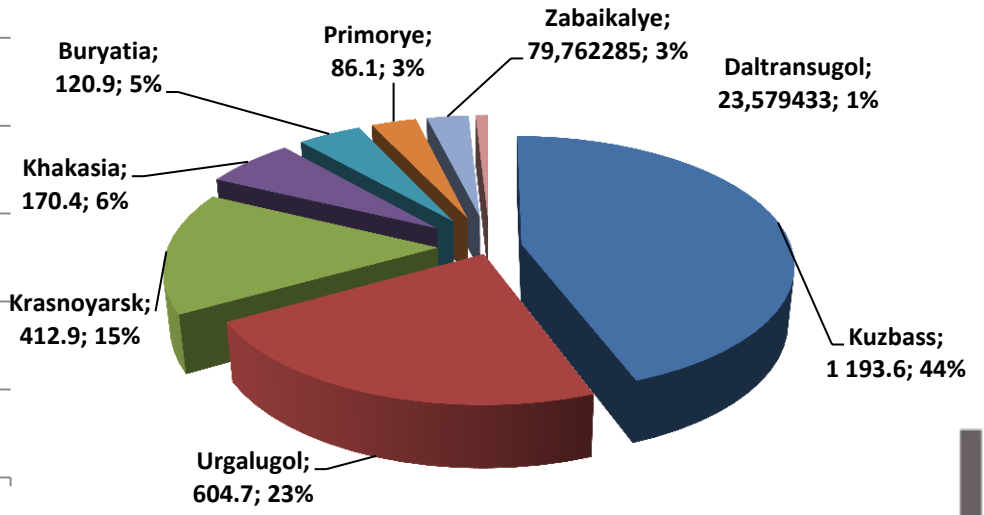
SAFETY CULTURE

SUEK. SAFETY. Health & safety measures funding

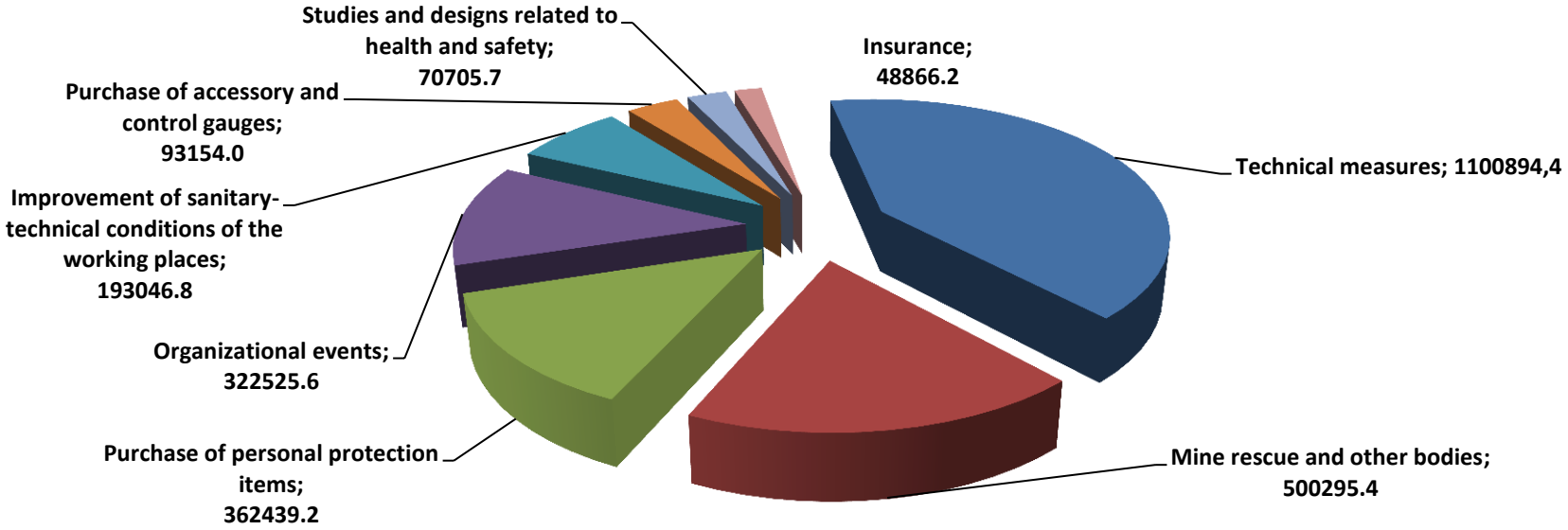
H&S measures funding dynamics 2006-2014 (M RUB)



Breakdown of funds spent for measures focused on H&S in 2014 by Regional offices (M RUB)



Breakdown of funds spent for measures focused on H&S in 2014 by items (M RUB)



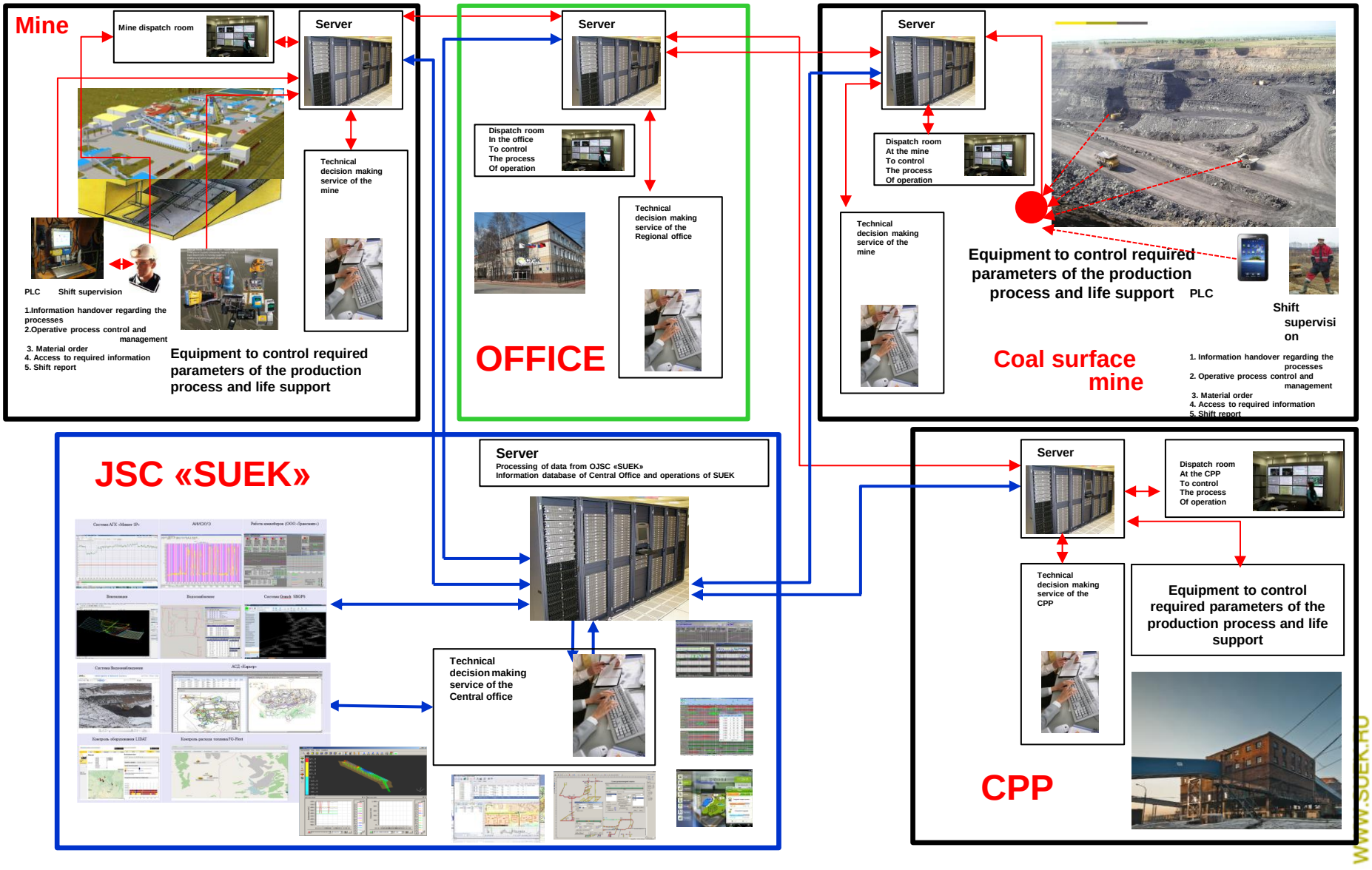
SUEK. SAFETY. Mine safety management system

According to the requirements of Federal law as from 21.07.1997 № 116-FZ “On mine safety at hazardous operations”, the companies in charge of hazardous operations shall:

- ✓ Create a mine safety management system, and provide its workability;
- ✓ Provide availability and workability of required control systems related to production processes;
- ✓ Take measures to protect life and health of workers in case of accident;
- ✓ Plan and implement measures to localize and fight the accident consequences;
- ✓ Create monitoring systems, systems of warning, communication and actions support in case of accident.

Within the mine safety management system of SUEK there is an integrated informational area that integrates the operation of analytical-dispatch centers. The centers receive information from various safety systems that provide safe mining operations, control and management of technological processes in both normal and emergency conditions.

Multifunctional safety system, JSC «SUEK»



SUEK situational dispatch center

Situational dispatch center (SDC) – is a room supplied with communication equipment (video conference, and other means of information presentation), designed for operative management and control, as well as monitoring of various items and situations.

The purpose of SDC is to improve the efficiency and quality of management solutions, prevention and elimination of crisis or emergency situations.

Major objectives of SDC:

1. **Trouble monitoring**

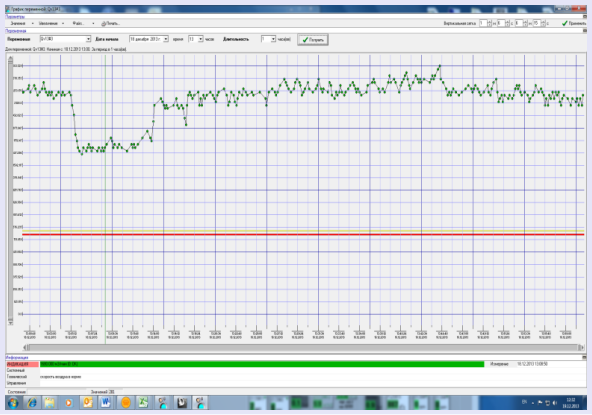
- Operative control of the situation at the operations;
- Forecasting of situations based on the incoming data;
- Warning on accidents and incidents.

2. **Provision of workability in case of emergency**

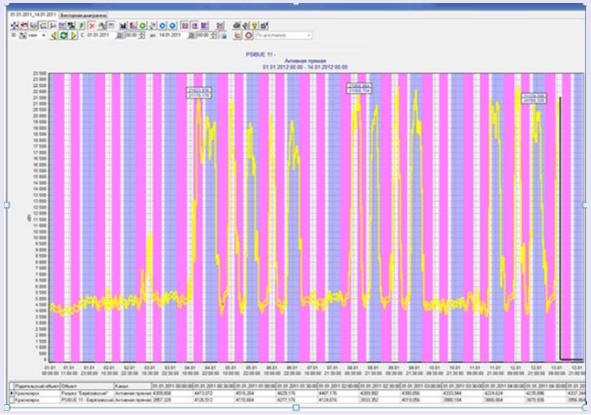
- On-line meetings using visualization equipment;
- Team work that includes specialist of various profiles;
- Provision of informational interaction using the means of on-line access to the data sources and video-conference communication.

Example of SDC screenshots for a coal mine

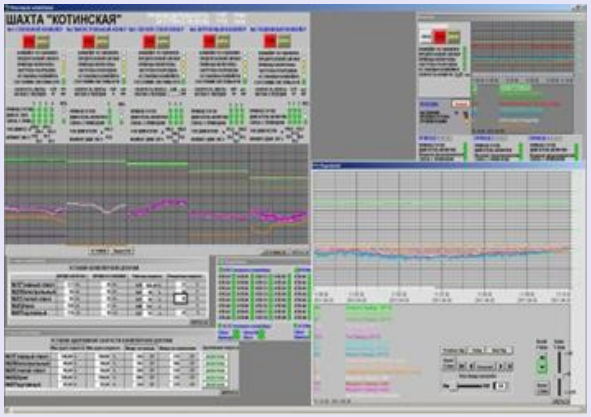
Air gas control system «Micron-1R»



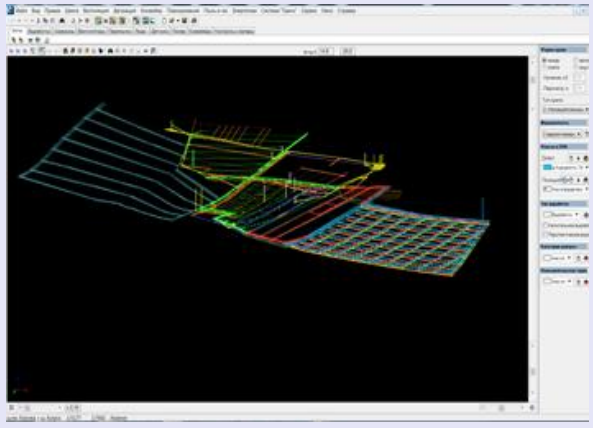
AIISKUE (АИИСКУЭ)



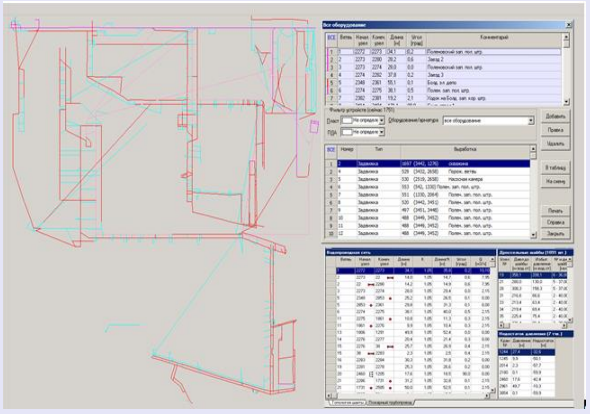
Operation of belts (LLC «Transmach»)



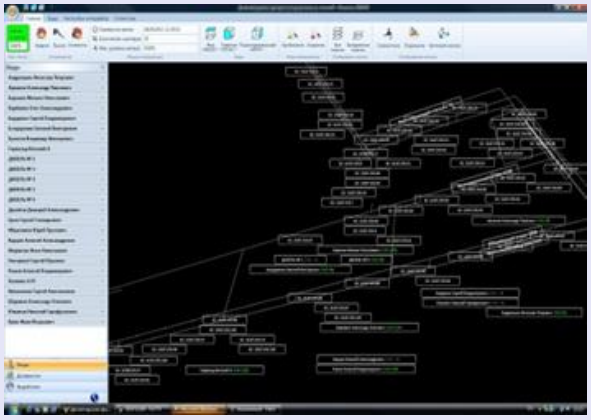
Ventilation



Water supply

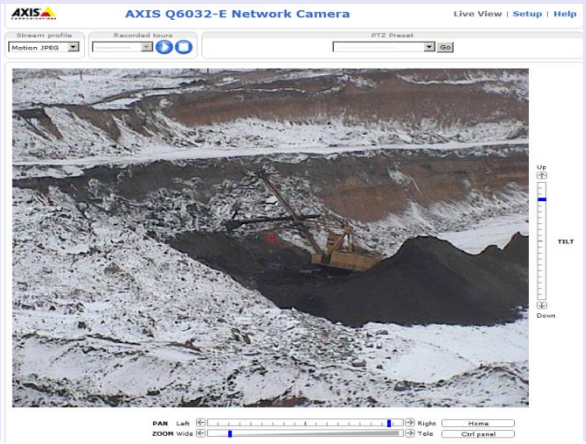


Granch SBGPS System

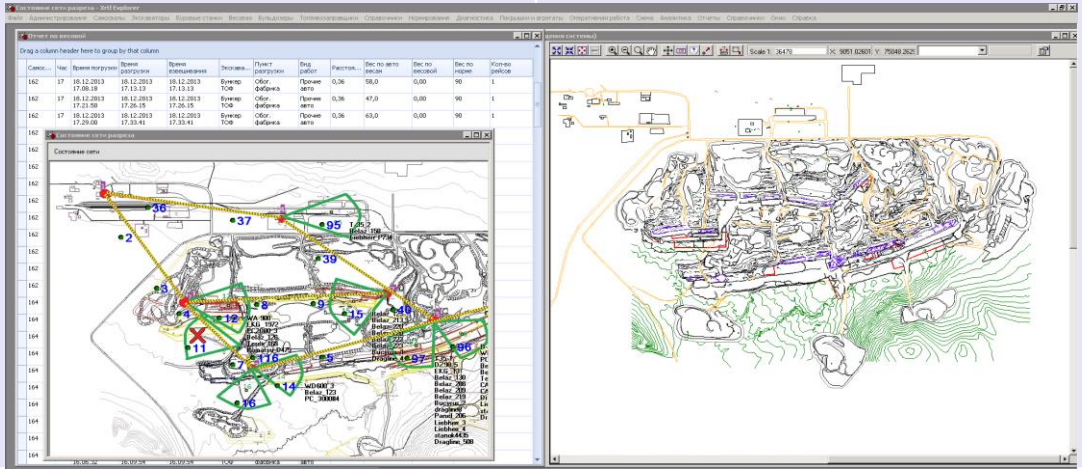


Example of SDC screenshots for a surface mine

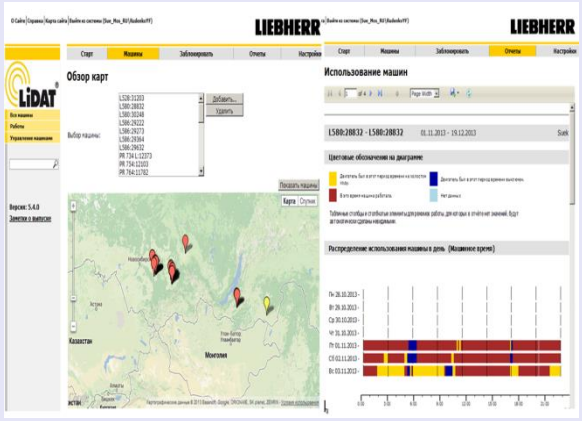
Video monitoring system



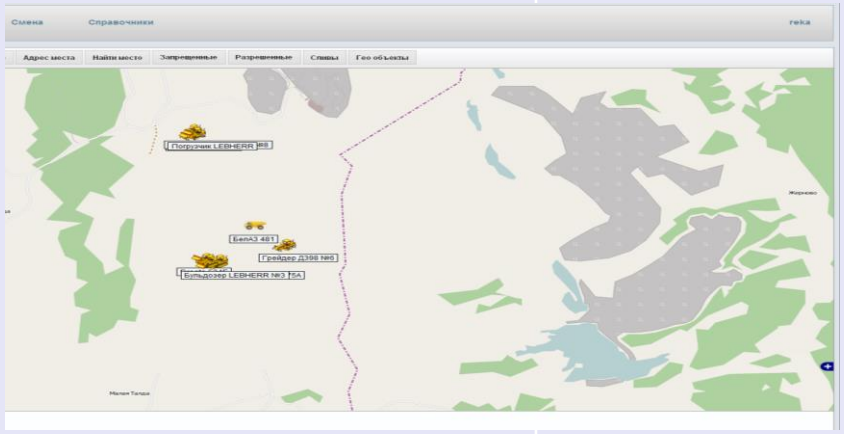
ASD «Pit»



Control of equipment LIDAT

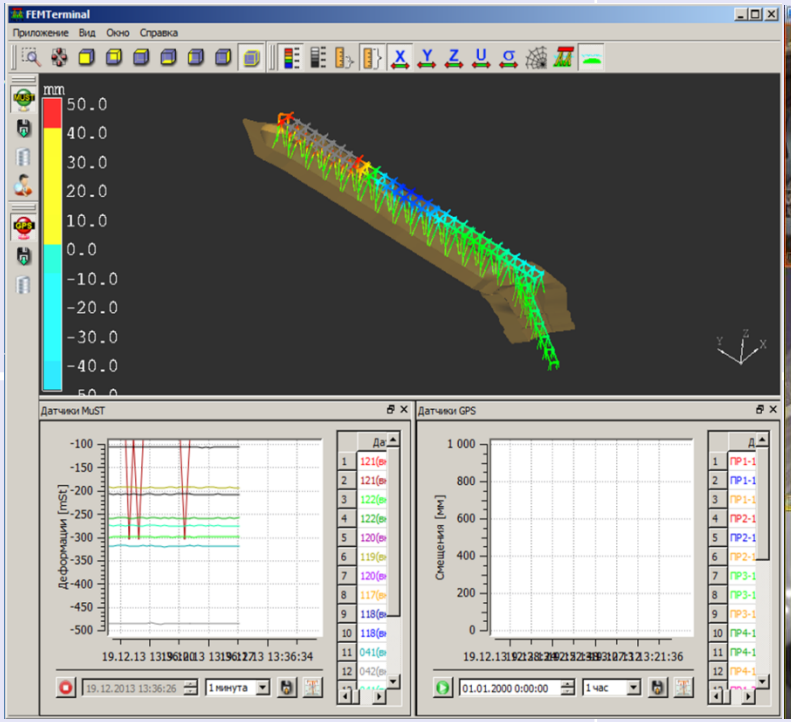


Fuel consumption control FG-Fleet



Example of SDC screenshots for a coal port terminal

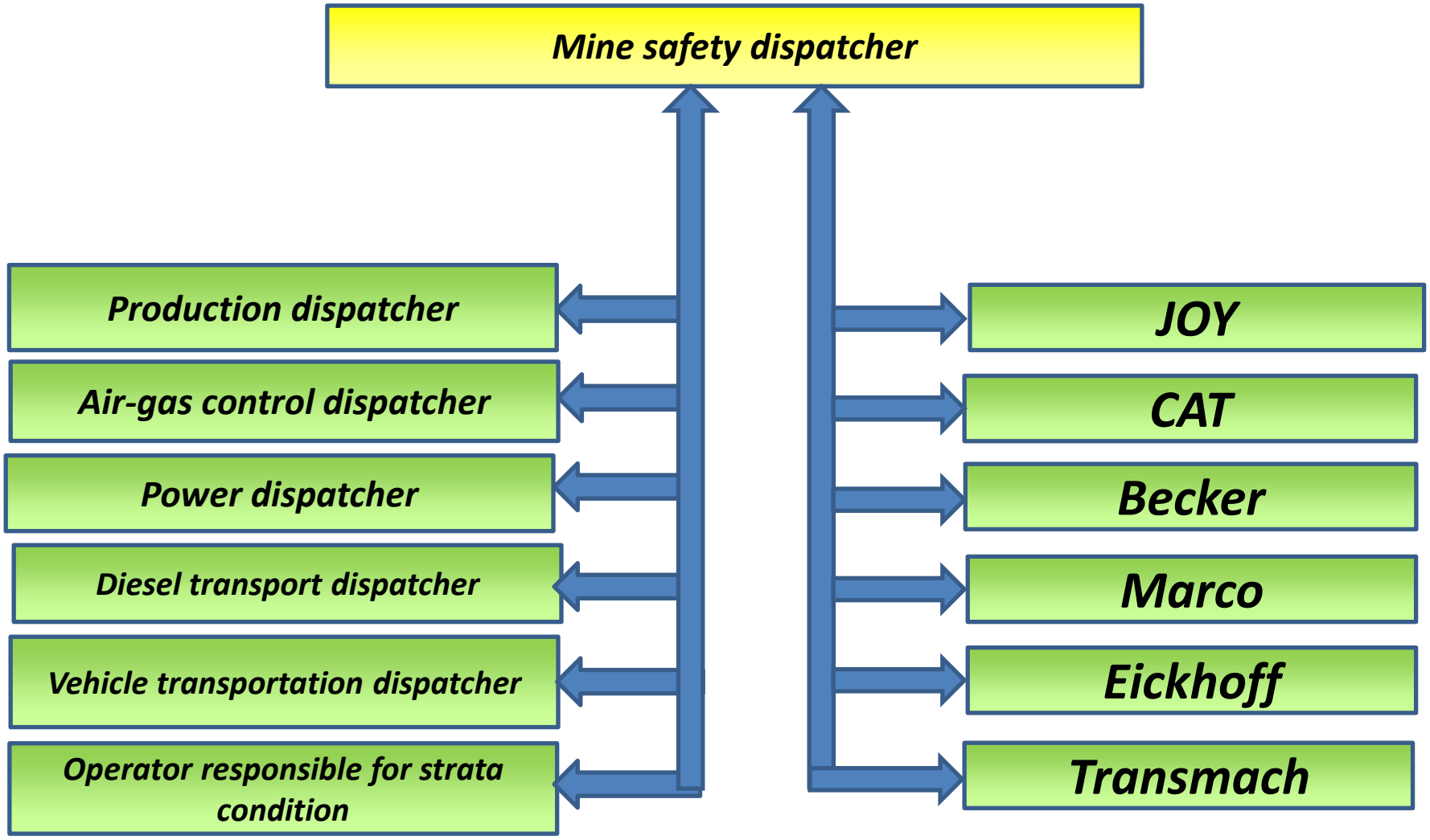
Dock control system



Video monitoring

Integrated dispatch-analytical center of OJSC «SUEK-Kuzbass»

Integrated dispatch-analytical center of OJSC «SUEK-Kuzbass»



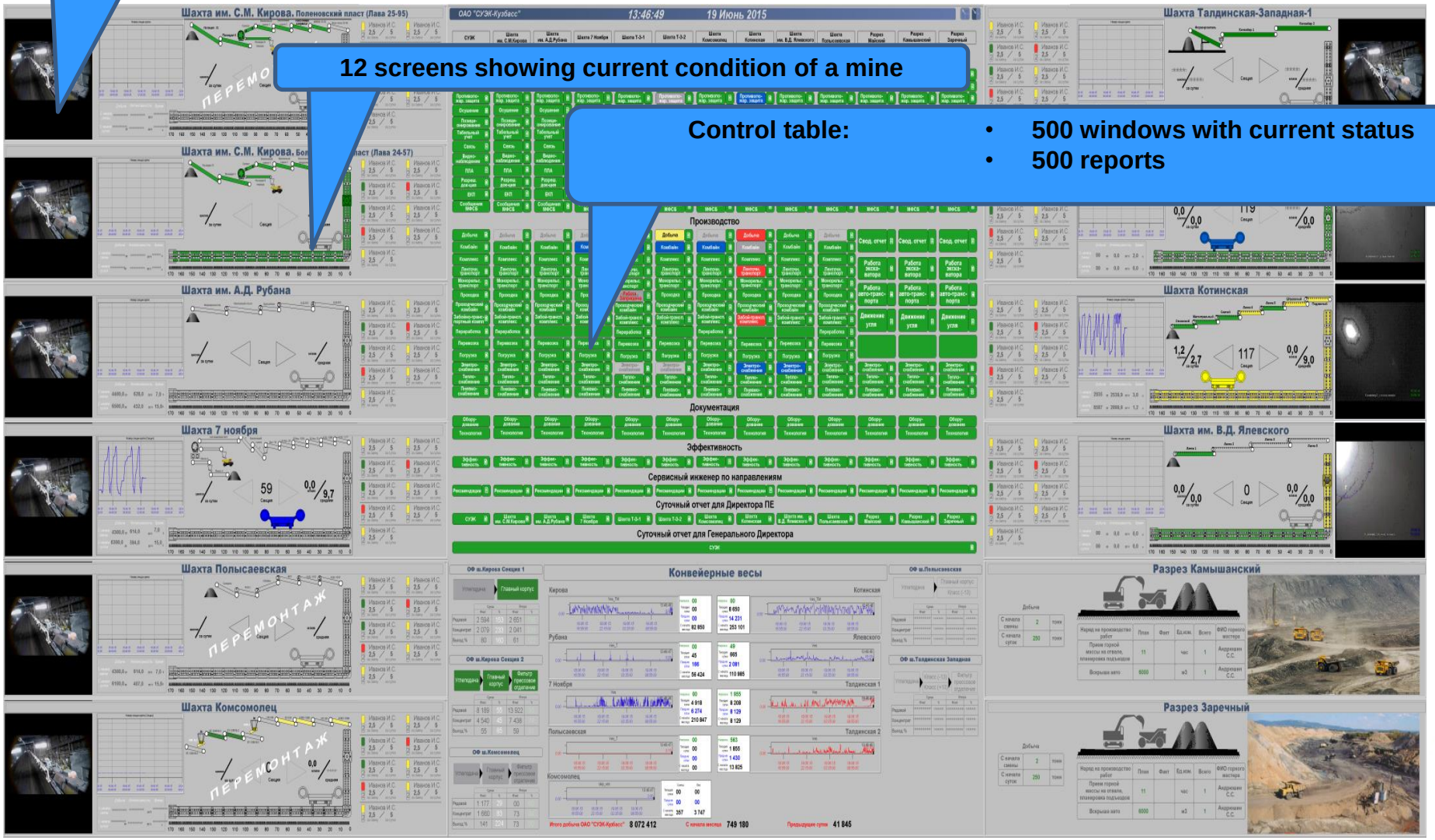
Major video wall of dispatcher in-charge of production in «SUEK-Kuzbass» comprises:

12 screens for 80 video cameras

12 screens showing current condition of a mine

Control table:

- **500 windows with current status**
- **500 reports**

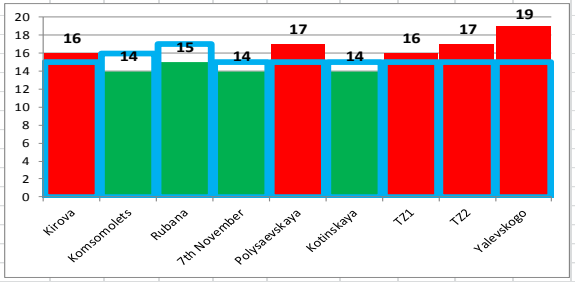


Daily automated report-analysis of production parameters SUEK-Kuzbass

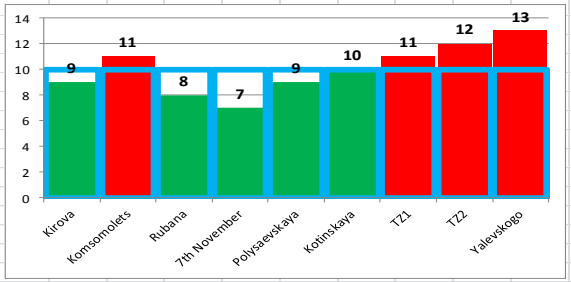
Production report for "__"_____20__ SUEK-Kuzbass

Section	Mine		Average for SUEK		Kirova		Komsomolets		Rubana		7th November		Polysaevskaya		Kotinskaya		TZ1		TZ2		Yalevs
	Параметр	units	plan	actual	plan	actual	plan	actual	plan	actual	plan	actual	plan	actual	plan	actual	plan	actual	plan	actual	plan
Production	Shears	000t			20	21	10	11	15	7	17	18	10	9	20	21	20	22	20	27	16
	Skips																				
	Conveyor scales																				
	CPP scales																				
	By dispatcher																				
	Surveyor's measurement																				
	Intensity				1,111	1,167	0,556	0,611	0,833	0,389	0,944	1	0,556	0,5	1,111	1,167	1,111	1,222	1,111	1,5	0,889
	Shipped																				
Quality	Ash	%			15	16	16	14	17	15	15	14	15	17	15	14	15	16	15	17	15
	Moisture				10	9	10	11	10	8	10	7	10	9	10	10	10	11	10	12	10
	CV	Kcal			5500	5735	5500	5478	5500	4453	5500	5775	5500	5665	5500	5363	6000	6155	6000	6065	5500
Oper.time	shearer	h				15		16		16		17		15		17		14		15	
	conveyor transport					16		18		20		21		18		19		17		17	
	hopper 1																				
	hopper 2																				
	Skips																				

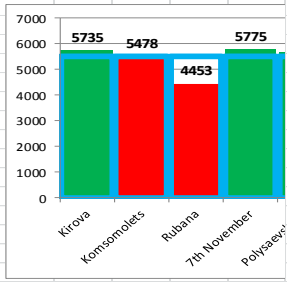
Ash, %



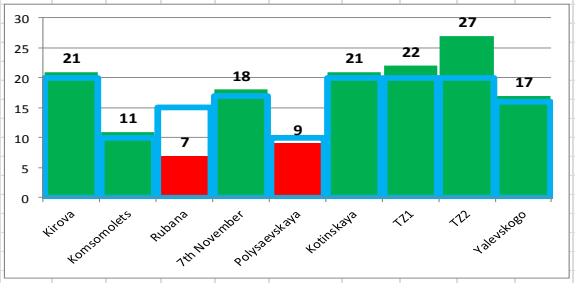
Moisture, %



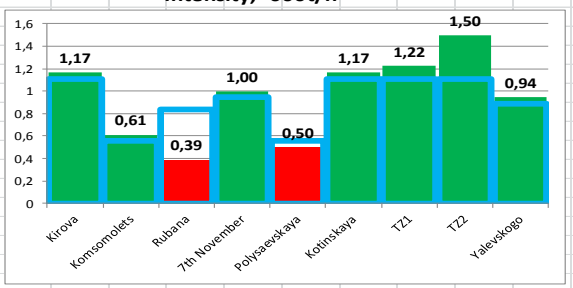
CV, KCal



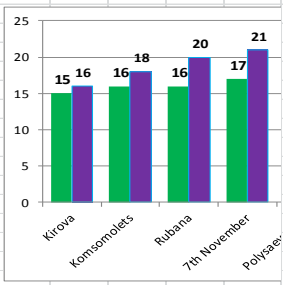
Production, '000t



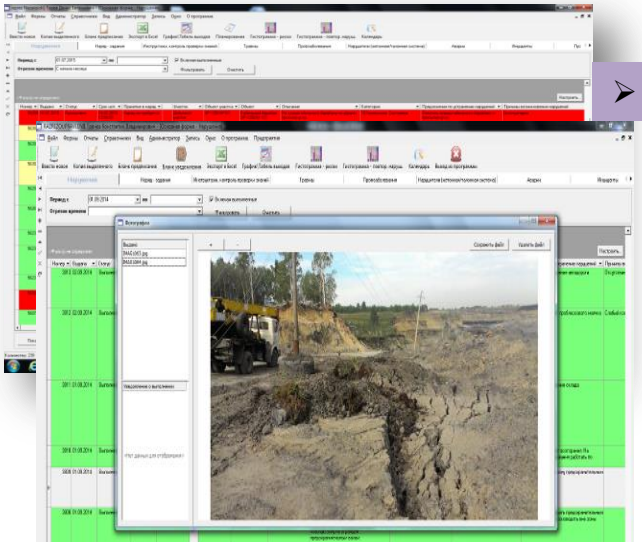
Intensity, '000t/h



Time in

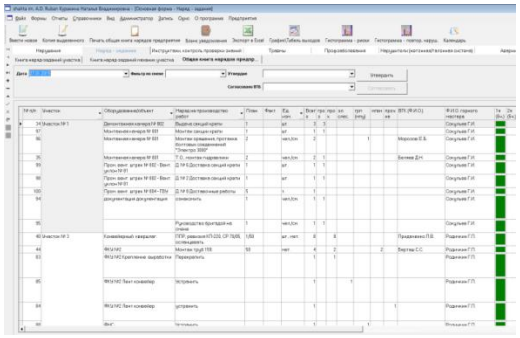


Introduction of software «Electronic infringements database and pre-shift briefing»



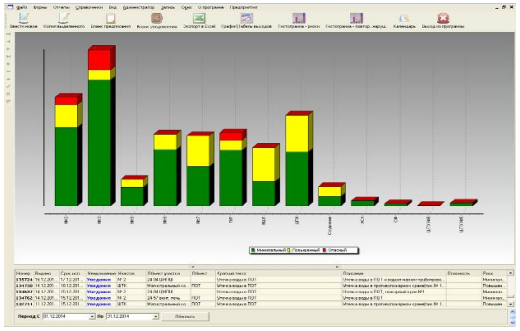
➢ Block of software called «Electronic infringements database»

- **Registration (including photo data) of violations as a result of production control and independent checks carried out**
- **Working out measures to remedy the violations of safety rules**
- **Monitoring of completeness and timeliness when to remedy the violations of safety rules**
- **Analysis of safety rules violation reasons**
- **Violations grading based on the risk criteria**
- **Transfer of the information on the violation of safety rules into pre-shift briefing system**



➢ Block of software called «Electronic pre-shift briefing»

The block «pre-shift task» is related to the block «pre-shift briefing». Such relation allows to form a task with respect to the information on the current situation and present violations of the safety rules. When the task is formed, the registered violations are supplied automatically into the pre-shift briefing book, and unless the **responsible officer won't assign someone to remedy the violation - the software will block the notification that it is fixed and won't allow to print the task out for the overman. It means that the shift task could not be approved without taking measures to remedy the violations registered previously.**



➢ Automated risk assessment

At any time the software can indicate the current status of hazardous production unit by displaying a RISK diagram on the screen. The diagram shows particularly important issues that require participation. That includes a breakdown by areas and factors of hazard. If necessary, the risk assessment could be adjusted manually.

The tool allows to prioritize the violations based on the hazard factor, and to manage the most hazardous first.