intellectual
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AVA3

ADVANCED INTELLIGENT INFRASTRUCTURE & INDUSTRY

# INTELLIGENT INDUSTRY

intellectual infrastructure & industry
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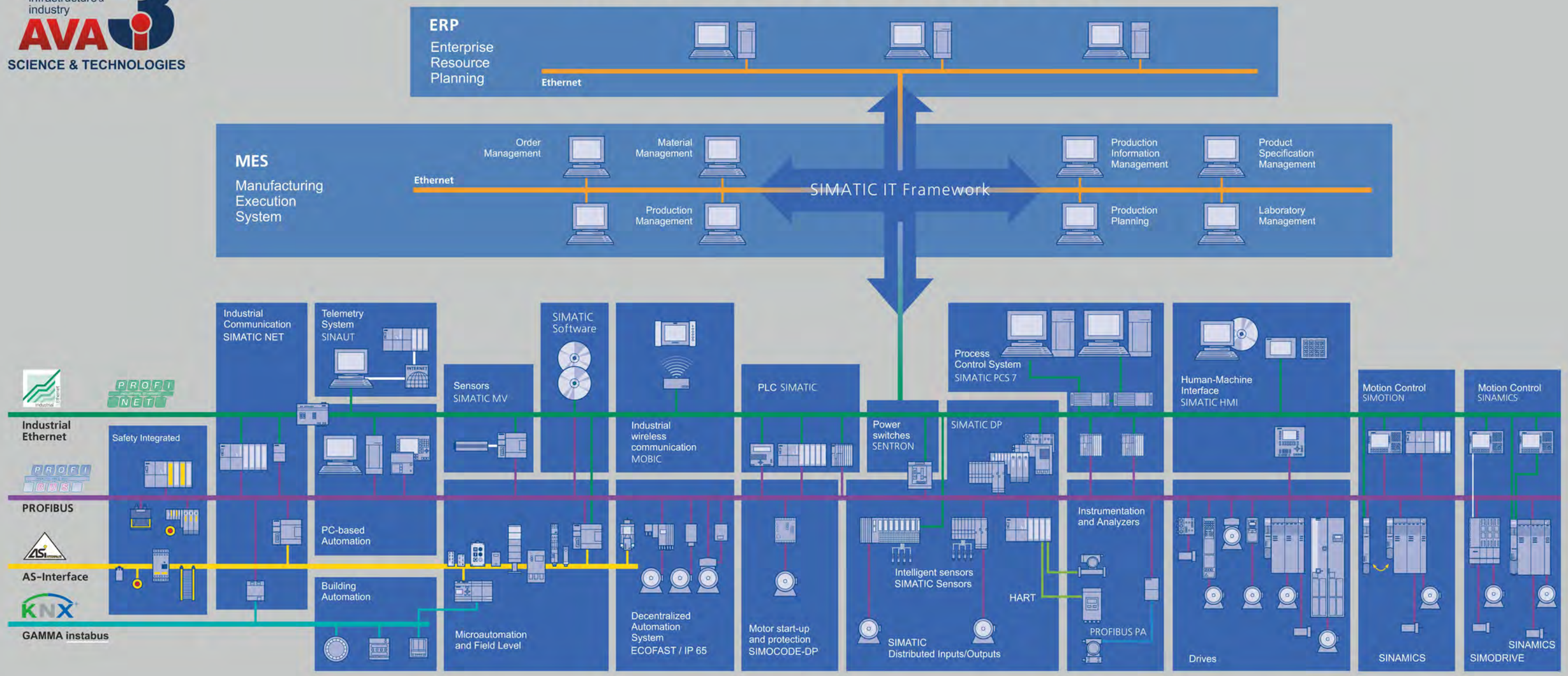
SCIENCE & TECHNOLOGIES

# TOTALLY INTEGRATED AUTOMATION



## Metals

Advanced and reliable automation solutions help increase productivity and safety of plants and improve product quality. Our systems successfully manage extreme conditions of ferrous and non-ferrous metal processing such as melting, casting, rolling, including water treatment and gas cleaning.

## Construction materials

Requirements to durability and safety of construction materials impose strict conditions towards process automation. Our solutions consider all norms and regulations required by legislation and best practices for production of cement, lime, insulation materials, construction boards and other products.

## Oil And Gas

Our proved solutions ensure optimum conditions and reliability for processes of extraction, refinery and delivery. Distributed measurements and remote controls are available even in distant areas for continuous monitoring and control in order to achieve the highest process efficiency.

## Energy

Safe, reliable and efficient control of power plants including turbines, boilers, switchgears and auxiliary systems is possible due to use of first-class solutions that ensure uninterruptible power supply for all types of consumers.

## Mining

Extensive experience in mining industry gives us opportunities to offer valuable cost-efficient solutions for stand-alone large drives such winches, fans, mills as well as complex automation systems for the whole chains of material mining, processing and transportation.

## Chemical Industry

Safety cannot be compromised in the chemical industry. We offer certified and proven solutions for explosive environment and aggressive media, which keep all processes in the defined limits. High accuracy of instrumentation and control systems ensure the best product quality.

## Food Production

Quality of produced food plays important role for human's health. Our systems and solutions are certified according to the latest regulations of this kind. They ensure the highest mark of respective standards while keeping customer's business efficient and profitable.

# METALS

## Automation of Steel treatment plants Severstal

### MAIN SYSTEM FUNCTIONS

- Process sequences
- Safety interlocking
- Material handling and dosing systems
- Oxygen lance control
- Reporting system and integration with MES

### AUTOMATION SYSTEMS AND COMPONENTS

- PLC - SIEMENS SIMATIC S7-414 + ET200M
- HMI – Simatic WinCC
- VSD Drives Sinamics – 24 pcs
- Sensors and Actuators: 180 pcs

Severstal

## Automation of tellurium production plant. UMMC

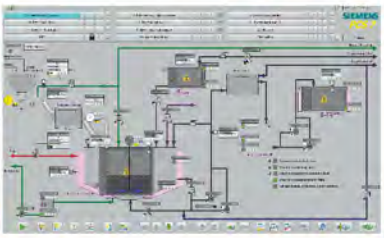
### MAIN SYSTEM FUNCTIONS

- Automatic control of the tellurium production stages
- Process interlocking and diagnostics
- Recipe management
- Control of the vacuum system

### AUTOMATION SYSTEMS AND COMPONENTS

- PLC - SIEMENS SIMATIC S7-416-3DP + ET200M
- Operator Workstation – Siemens PC + PCS7
- Node operator panel – Siemens KP700 – 9 pcs.
- VSD Sinamics G120, Siemens - 18 pcs .
- Digital signals - 800
- Analog signals - 200

УГМК UMMC



## Automation of roll inspection and cooling line. Evraz NTMK

### MAIN SYSTEM FUNCTIONS

- Control group drive roller conveyors
- Management of cooling refrigerators
- Control of rolls tilters

### AUTOMATION SYSTEMS AND COMPONENTS

- PLC Siemens S7-317-DP + ET200S;
- Operator Workstation - MP377 + WinCC flexible;
- VSD MICROMASTER 440, Siemens - 22 pcs;
- Digital signals - 550;
- Analog signals - 85;
- Encoders -13 pcs

EVRAZ

## Automation of copper-refining plant. UMMC

### MAIN SYSTEM FUNCTIONS

- Control of Electrolyte solution: preparation, stabilization & filtration
- Control of electrolyte process by transformer-rectifier
- Control of solution circulation, incoming and outgoing
- Control of process water, reagent feed, sumps conditions and utilities
- Monitoring of anode and cathode treating machines, technological cranes, filters
- Communication to MES

### AUTOMATION SYSTEMS AND COMPONENTS

- PLC - SIEMENS SIMATIC S7-417-5H + ET200M
- PCS – Siemens PCS7 2 pcs.
- Redundant Workstations – Siemens
- Redundant Servers – Siemens PC –PC – 2 pcs.
- VSD ACS800, ABB - 80 pcs .;
- Sensors & Actuators by Profibus-PA – 400 pcs.

УГМК UMMC

## Automation of wire-galvanization process. NLMK

### MAIN SYSTEM FUNCTIONS

- Control of conveyors, valves and motors
- Wire-line speed master
- Control of temperature of the molten zinc and the annealing furnace
- Control of temperature and level of acid in the pickling and fluxing baths
- Control of drying temperature of the wire

### AUTOMATION SYSTEMS AND COMPONENTS

- PLC - SIEMENS SIMATIC S7-414-2DP + ET200M
- Operator Workstation - Panel PC 677-15 + WinCC flexible;
- VSD MICROMASTER 440, Siemens - 62 pcs .;
- Digital signals - 300;
- Analog signals - 32;
- Encoders -20 pcs.
- SITRANS level meters – 5 pcs.

NLMK

## Automation of Blast furnace UMMC

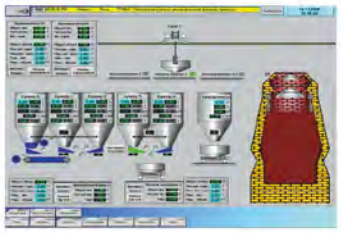
### MAIN SYSTEM FUNCTIONS

- Increased system reliability
- Safety interlocking
- Process sequences
- Furnace proper, Stoves, Charging control

### AUTOMATION SYSTEMS AND COMPONENTS

- PLC - SIEMENS SIMATIC S7-414 + ET200M
- HMI – Wonderware InTouch
- VSD Drives Sinamics: 20 pcs
- Sensors and Actuators: 400 pcs

УГМК UMMC

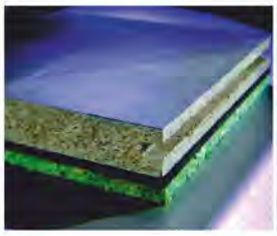


# CONSTRUCTION MATERIALS

## Automation of cement-bonded particle (CBP) boards production. Tyumen

### MAIN SYSTEM FUNCTIONS
- Material-handling and transportation systems;
- Material mixing and dosing systems
- Pressing, forming and heating systems
- Product handling, transportation and stacking

### AUTOMATION SYSTEMS AND COMPONENTS
- SIEMENS SIMATIC Box IPC WinAC, ET200S;
- Siemens WinCC HMI
- Control cubicles – 8 pcs;
- Local control panels – 5 pcs;
- Digital IOs – 1200 pcs;
- Analog IOs– 8 pcs;
- Weighing modules SIWAREX – 4 pcs;
- VSD Drives Siemens Sinamics – 20 pcs;
- Soft-Starters Siemens Sirius 3RW – 5 pcs;
- Material-tracking system;
- Press-control package;
- Dosing stations.

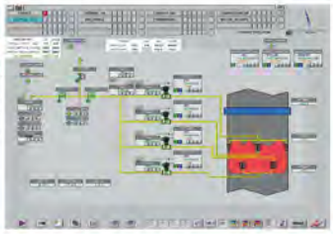


## Automation of lime production. Bogdanovich

### MAIN SYSTEM FUNCTIONS
- Material handling and dosing systems
- Lime-furnace process controls
- Product handling systems
- Advances diagnostic and reporting features

### SCOPE OF WORK
- Project design and software development
- Procurement and cubicle manufacturing
- Installation & Commissioning

### AUTOMATION SYSTEMS AND COMPONENTS
- Siemens PCS 7 v7.1 including software and hardware tools and components
- PLCs Siemens 416-2 with ET 200M distributed IOs

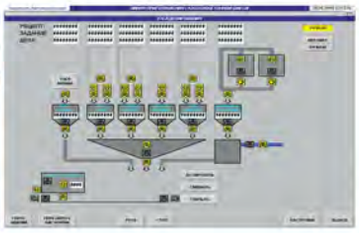


## "Atomstroykompleks", Ekaterinburg

### MAIN SYSTEM FUNCTIONS
- Project design, delivery of equipment and implementation automation system for dosing and mixing of the components for the manufacture of building blocks
- PCS of gas-ash concrete mixture preparation plant

### AUTOMATION SYSTEMS AND COMPONENTS
- Automation station Siemens Simatic S7-315-2DP
- HMI Siemens WinCC flexible
- 4 weighting cells by Siwarex-U
- 128 discrete I/O signals
- 16 analog I/O signals

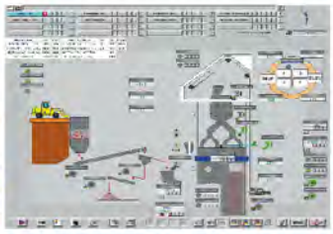
### AUTOMATION SYSTEMS AND COMPONENTS
- Automation station Siemens Simatic S7-315-2DP
- HMI Siemens WinCC flexible
- 6 weighting cells by Siwarex-U
- 80 discrete I/O signals
- 10 analog I/O signals



## Automation of lime production. Sysert

### MAIN SYSTEM FUNCTIONS
- Material handling and dosing systems
- Lime-furnace process controls
- Product handling systems
- Advanced diagnostic and reporting features

### AUTOMATION SYSTEMS AND COMPONENTS
- Siemens PCS 7 v 7.1 including software and hardware tools and components
- Siemens PLCs 416-2 with ET 200M distributed IOs
- VSD Drives Omron 30-75 kW – 18 pcs
- Digital IOs – 756 pcs;
- Analog IOs– 260 pcs;
- Weighing modules SIWAREX – 8 pcs
- Level measurement SITRANS LR400 HART – 4 pcs.



## "Atomstroykompleks", Ekaterinburg

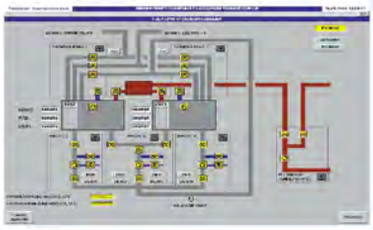
**PCS of sludge solution preparation plant**
**PCS of mixing site for the ash-concrete production line**

### MAIN SYSTEM FUNCTIONS
- Control valves of solution transportation piping
- Temperature control
- Mixture density adjusting

### AUTOMATION SYSTEMS AND COMPONENTS
- Automation station Siemens Simatic S7-315-2DP
- HMI Siemens WinCC flexible
- 160 discrete I/O signals
- 16 analog I/O signals

### MAIN SYSTEM FUNCTIONS
- Dosing system of 4 components
- Mixing system
- Casting system

### AUTOMATION SYSTEMS AND COMPONENTS
- Automation station Siemens Simatic S7-313
- HMI Siemens WinCC flexible
- 6 weighting cells by Siwarex-U
- 128 discrete I/O signals
- 8 analog I/O signals
- 4 transportation screws controlled by VSD Siemens Sinamics G120

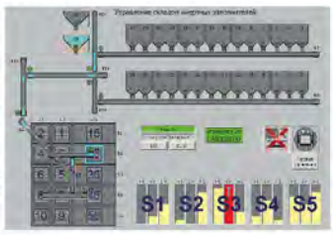


## Industrial warehouse «Izoplit», Ekaterinburg

**PCS warehouse of inert materials**

### MAIN SYSTEM FUNCTIONS
- Conveyors control, shutters and vibrators, safety interlocking
- Automatic positioning of «Liebherr» mobile conveyor to the selected operational bunker
- Control of load currents at conveyors drives
- Control of the conveyor belt motion sensors
- Measurement of the raw material level in the feed hopper
- Automatic termination of feeding at overfilling of the hopper

### AUTOMATION SYSTEMS AND COMPONENTS
- Automation station Siemens Simatic S7-315-2DP
- HMI Siemens WinCC flexible
- 224 discrete I/O signals
- 8 analog I/O signals
- 5 motor control by Siemens SIMOCODE
- 5 radar level sensors Siemens SITRANS LR 400



# ENERGY, OIL AND GAS, MINING, CHEMICAL INDUSTRY

## Magnitogorsk Power Station
## Automatic control systems of boiler-plants processes

### MAIN SYSTEM FUNCTIONS
- Control of shut-off and control valves
- Management of circulation pumps
- Regulation of the condensate level in the boilers
- Switch over of circulation pumps

### AUTOMATION SYSTEMS AND COMPONENTS
- PLC - S7-315-2DP + ET200S CPU
- Workstations - MP377 - 2 pcs
- Local control panel - MP177
- Digital signals - 600
- Analog signals - 110

MAGNITOGORSK IRON & STEEL WORKS GROUP

## Nizhnekamsk Power Plant. Water Treatment
## Modernization of condensate reception system and decomposition plant

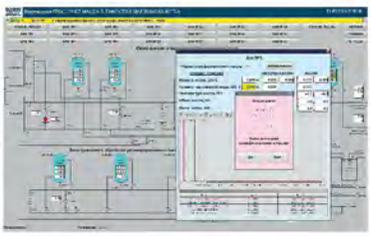
### MAIN SYSTEM FUNCTIONS
- Condensate reception control
- Condensate decomposition process control
- Automatic switching of filters to regeneration
- Regeneration of filters by chemical reagents
- Blowing filters
- Control of the chemical composition of desalted condensate
- Report generation.

### AUTOMATION SYSTEMS AND COMPONENTS
- PLC: S7-410-5H;
- Workstation: PC + WinCC;
- Digital inputs -416;
- Digital outputs -384;
- Analog inputs -96.
- Analog outputs -32.

## Oil facilities plant, «ENEL OGK-5»
## Branch of Reftinskaya TPP

### MAIN SYSTEM FUNCTIONS
- Recording of oil level in the tanks of oil facilities
- Oil transportation control
- Monitoring of running hours and wear of oil pumps
- Reporting

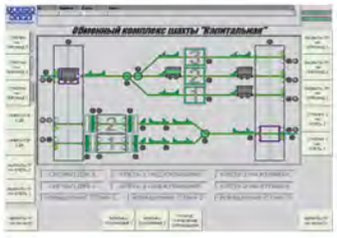
### AUTOMATION SYSTEMS AND COMPONENTS
- Automation station Siemens Simatic S7-314
- HMI Siemens WinCC
- 48 discrete I/O signals
- 36 analog I/O signals
- Third-party equipment communicated via RS-485 interface



## PCS of exchange station of Emerald mine "K" Russia

### MAIN SYSTEM FUNCTIONS
- Management of transport wagons;
- Management of reloading facilities;
- Coordinating the work of the exchange station with the mining lift units.

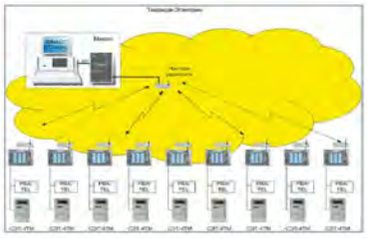
### AUTOMATION SYSTEMS AND COMPONENTS
- PLC - SIEMENS SIMATIC S7-315-2DP + ET200M
- Operator Workstation – Siemens Panel PC + WinCC Flexible
- Discrete signals - 300
- Analog signals - 5



## PCS of high-voltage circuit breakers (reclosers)
## «TAVRIDA ELECTRIC URAL»

### MAIN SYSTEM FUNCTIONS
- Remote control of 16 reclosers via radio and bus ModBus-RTU;
- Electricity metering by 16 power meters via RS-485

### AUTOMATION SYSTEMS AND COMPONENTS
- 1 automation stations Siemens Simatic S7-315-2DP
- 11 Siemens Simatic S7-313C-2PtP
- HMI Siemens WinCC
- 12 remote control modules via radio channel by Siemens SINAUT ST7
- 100 discrete I/O signals



## Mining plant "South"
## Management and control of fire-protection systems

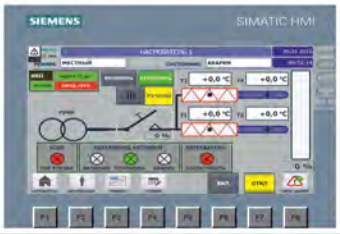
### MAIN SYSTEM FUNCTIONS
- Management and control of fire-protection systems

### AUTOMATION SYSTEMS AND COMPONENTS
- Data transmission to the coordinating workstation (PCS7).
- PLC – S7-416;
- Workstation – PC + PCS7;
- Fire-protection station SYNOVA

# FOOD INDUSTRY

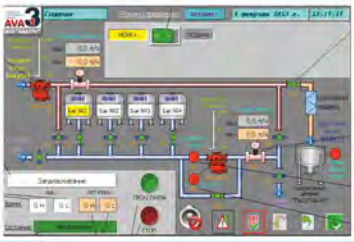
## Arrangement of cluster sites of the Suzum deposit
### Automatic heating control system
**MAIN SYSTEM FUNCTIONS**
- Control of the vacuum contactor in the power line of the heater;
- Status control of main components:
  - Opening-closing of the vacuum contactor
  - Fault status of the vacuum contactor
  - Integrity of the heating circuit
  - Leakage over-current
  - Operational status of internal uninterruptible power supply
  - Temperatures in the heating circuit and pipes;
- Display of the process technology at the operator panel;
- Communication with the process control system via the Modbus RTU protocol, with the transfer of the main parameters of the control system: run, stop, fault.

**AUTOMATION SYSTEMS AND COMPONENTS**
- PLC - S7-315-2DP + ET200S CPU
- Workstations - MP377 - 2 pcs
- Local control panel - MP177
- Digital signals - 600
- Analog signals - 110



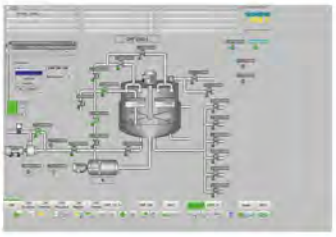

## Yogurt production. Danone
**MAIN SYSTEM FUNCTIONS**
- Automatic control of additives concentration;
- Automatic productivity control;
- Product tracking and reporting;
- Data exchange to superimposed systems;
- Equipment-condition monitoring and reporting system.

- **AUTOMATION SYSTEMS AND COMPONENTS**
- SIEMENS SIMATIC S7-1200
- Touch-control panel 7" SIEMENS TP 700 Comfort
- Control cubicle- 1 pc.;
- VSD Drives SINSMIX G120C
- Electromagnetic flowmeters SITRANS FC
- Mass flowmeters SITRANS FC Mass
- Conductive level monitor VEGAKON
- Pneumatic drive SY3000.



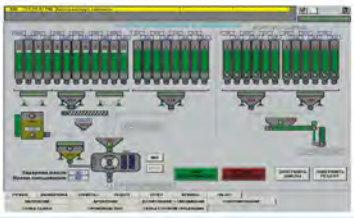
## PCS production line of shampoo Unilever
**MAIN SYSTEM FUNCTIONS**
- S13000 reactor control and selection of receipt
- Control of homogenizer
- Control of mixers
- Control of temperature and vacuum processes
- Control of pumping tank level by weight
- Integration with MES of enterprise

**AUTOMATION SYSTEMS AND COMPONENTS**
- PLC - SIEMENS SIMATIC SIMATIC S7-416-2 + ET200M
- PCS – Siemens PCS7
- Operator Workstation – Siemens Panel PC + WinCC Flexible
- VSD MICROMASTER 440, Siemens - 2 pcs



## Loose and granular feed production, Chernyanka
**MAIN SYSTEM FUNCTIONS**
- Automatic control of raw-material transportation routes
- Control of sensors in silos, with automatic switch-off of raw material loading at overflow of hopper
- Monitoring of drive-load currents
- Automatic control of batch dosing and mixing for a given recipe
- Storage of previously defined recipes in the database of recipes on the operator workstation
- Automatic calculation of setpoints for dosing, based on a given recipe and generated order
- Generation of raw-material consumption report after a recipe execution
- Data archiving for each cycle of dosing-mixing
- Logging of alarms, warnings, operator actions and process events.

**AUTOMATION SYSTEMS AND COMPONENTS**
- PLC - S7-315-2DP + ET200S CPU
- Workstations - PC with two monitors, WinCC SCADA system
- 500 digital inputs
- 400 digital outputs
- 16 analog inputs
- 8 weight-measuring Siwarex-U channels



intellectual infrastructure & industry
3MATIC

**Fields of application:**
- Treatment Plants
- Water treatment plants
- Water-supply systems
- Waste water discharge
- Desalination plants
- Metal waterworks
- Oil tanks
- Pipelines
- Refineries
- Pumping stations
- Power stations (coal, gas, oil)
- Nuclear Power Plants
- Combined heat and power plants
- District heating
- Hydroelectric power plants
- Geothermal power plants
- Solar thermal power plants
- Biogas power plants

## Own development: explosion-proof electric drives with TRIMATIC control unit for control valves
**UNITS INCLUDED IN THE DRIVE PROVIDE THE FOLLOWING FUNCTIONS:**
- Non-contact 2-directional actuation of asynchronous motor;
- Torque monitoring of the actuator;
- Automatic stop of the actuator in case of extra torque;
- Non-volatile position control of the actuator;
- Automatic stop of the actuator at the preset and limit positions;
- Local and remote control of the actuator;
- Remote indication of the actuator status;
- Local digital and light indication of operating modes and parameters of the unit;
- Protection of the actuator in emergency operation;
- Archiving of events, commands and alarms in the non-volatile memory;
- Two-way exchange of information with the DCS via RS serial interface - 485 with Modbus RTU communication protocol

**Mission:** We modernize and develop economy, increase quality of life and safety of people through implementation of advanced intelligent solutions into industry and infrastructure.

**AVATRi - Technopark-Automation Group company**

TECHNOPARK automation

VALUE ADDED RESELLER

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SYSTEM AUTOMATION

SIEMENS

Schneider Electric · Honeywell · BOSCH · Panasonic · Danfoss · CAREL · PHOENIX CONTACT · ABB · RITTAL · LAPP KABEL

- Components for integrated automation
- Electronic and electrical equipment
- Switchboard equipment
- Wires and cables

- Industry automation
- Building technologies
- Power distribution
- Manufacturing of panels and cubicles for automation and power distribution

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