



S\_IND PROCESS CONTROL SRL

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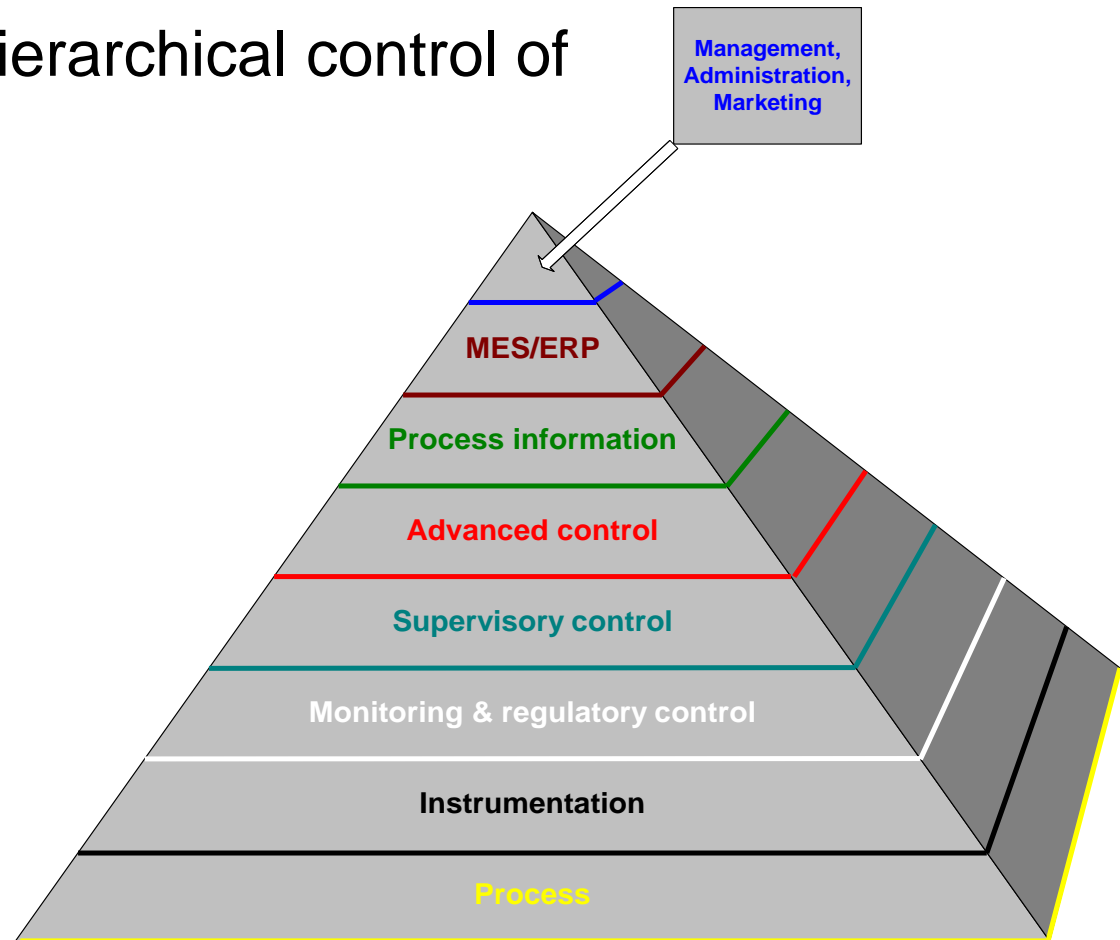
Mail: office@s-ind.eu

Bucharest, Romania



# Open architectures for hierarchical control of industrial process

- Hierarchical control
- Control system structures
- Control system basics
- Control system design
- Advanced Control
- Process control optimization





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Bucharest, Romania

- Robots programming and linear axis
- Artificial vision and image processing
- Complex industrial automation
- SCADA system and GPRS remote control
- Energy recovery machine ORC
- Distributed control system in petrochemical plant
- Open architectures and industrial protocols
- Plant information system
- Automation projects
- Electrical Projects

## Robots programming and linear axis

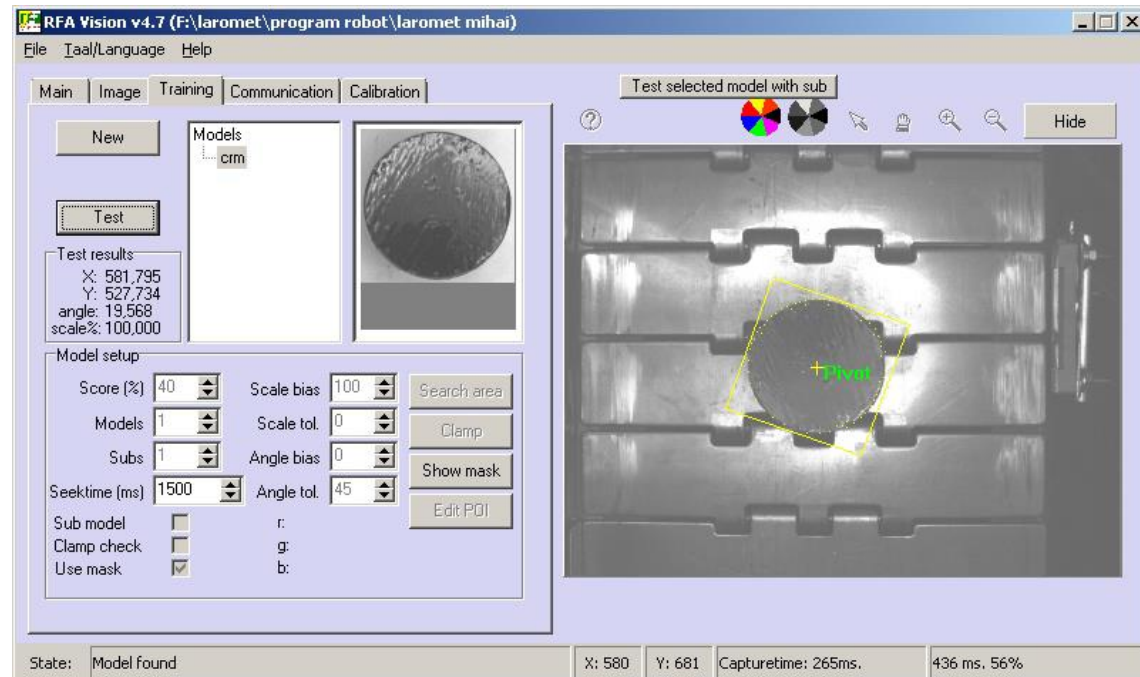
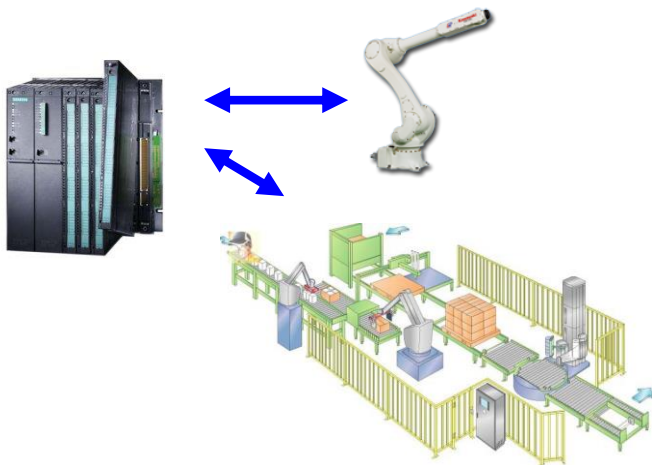
- Solution for robots integration in flexible manufacturing systems
- Support design, bidding plates, gripper fingers
- Direct experience in Adept, Kawasaki robots and Yamaha linear axis programming



# Artificial vision

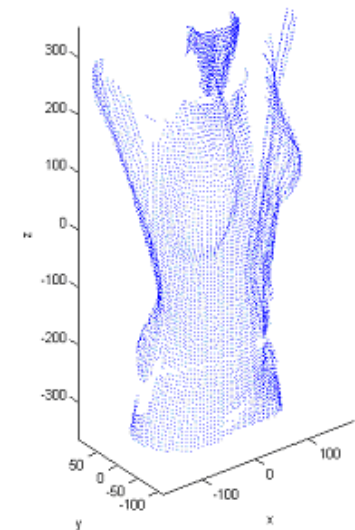
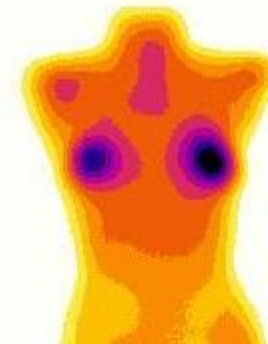
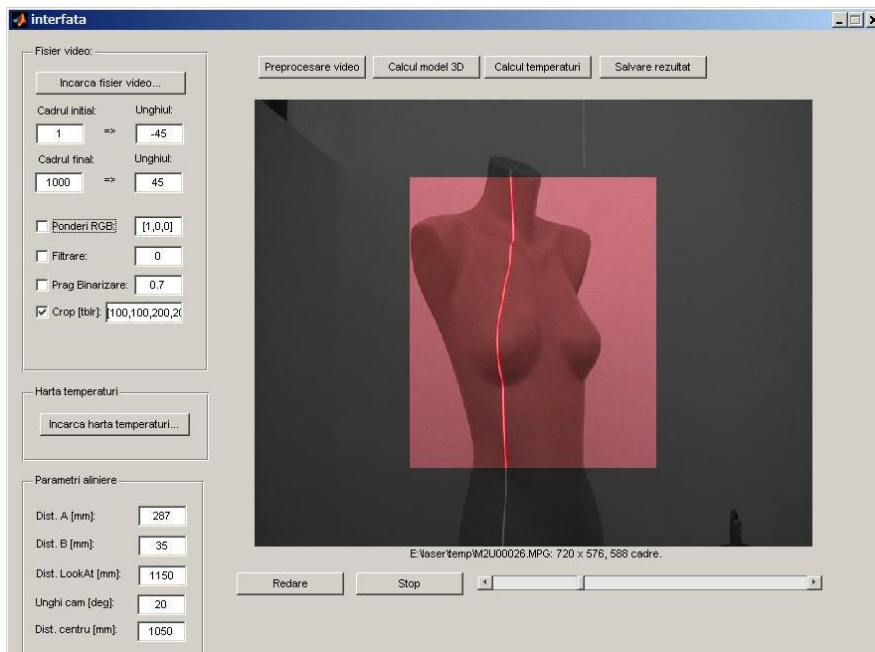
- Fixed and mobile parts grabbing based on artificial vision

- Robot integration in the complex production flux controlled by the PLC



# Image processing

- Infrared image processing in order to obtain temperature distribution or working with laser beams for obtaining 3D map



# Processes based on discrete and continuous events

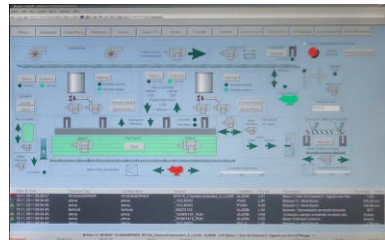
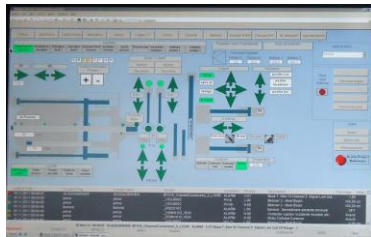
- Terminal treating heater

Speed control,  
temperature  
control, treating  
diagram following



# Laromet

- 2500Tf forge
- Automation solution rebuild
- Dead time reducing with 16s per cycle
- Continuous speed control of coils

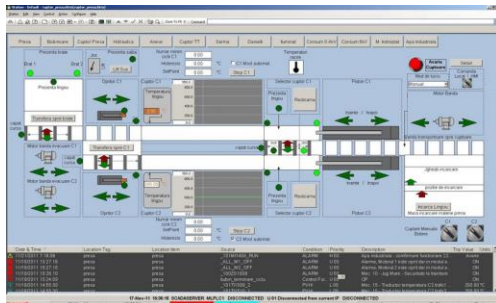




# Metallurgical Industry

- Induction heaters

Automation and integration in production flow.

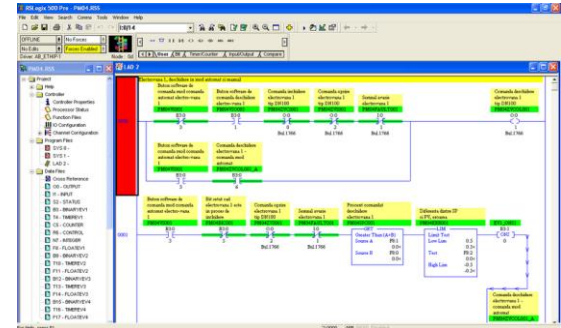
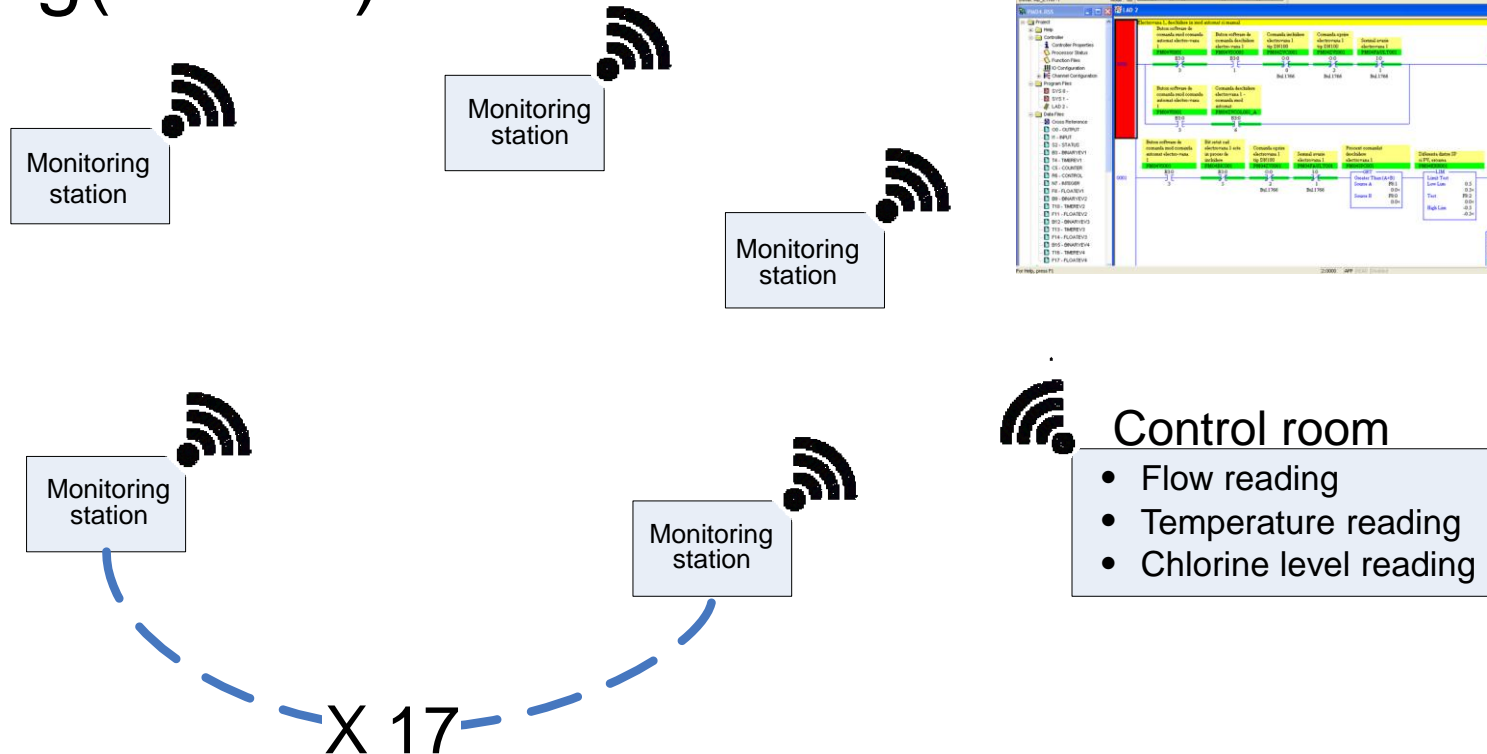


# Automation cabinets

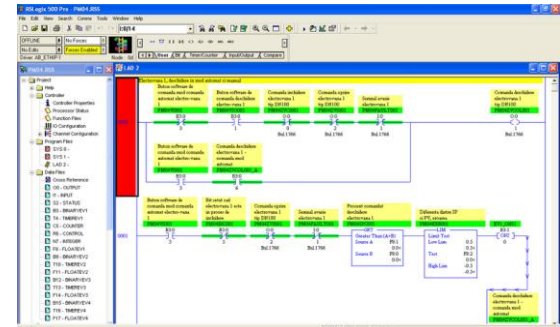
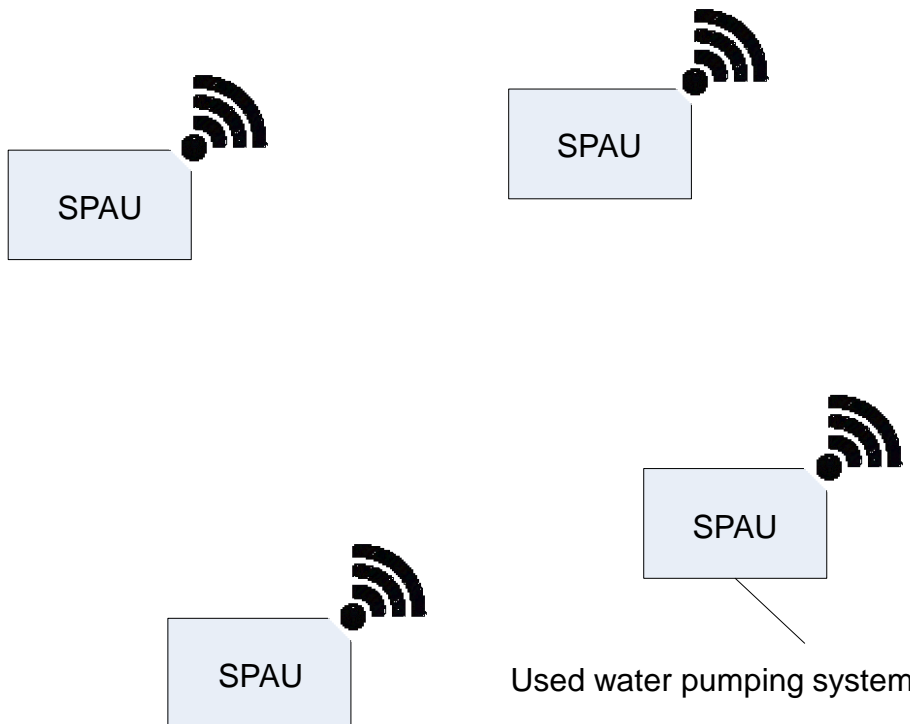

- Execution
- Design



# SCADA systems, potable water feeding(GPRS) remote control



# SCADA systems, used water pumping(GPRS) remote control

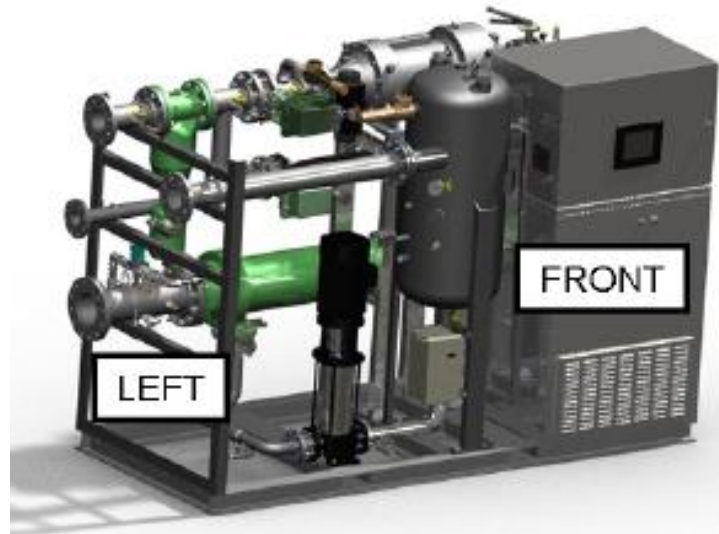



**Dispecerat**

- Start/Stop Comand
- Parameters reading
- Working schedule

# Green Energy

Supervising start-up Energy recovery machine from burned gas using Rankin cycle ORC



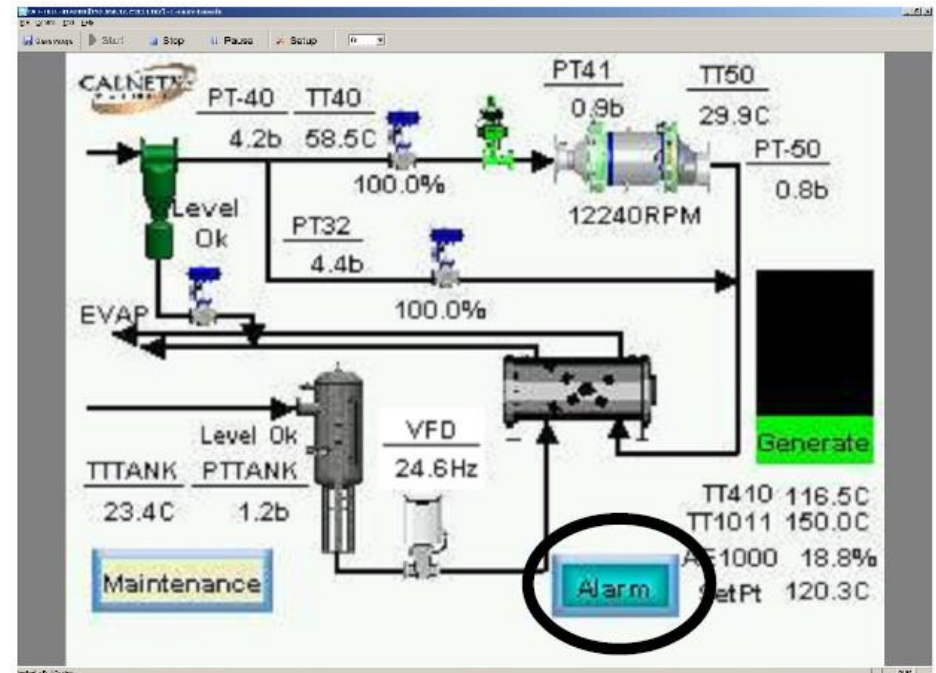
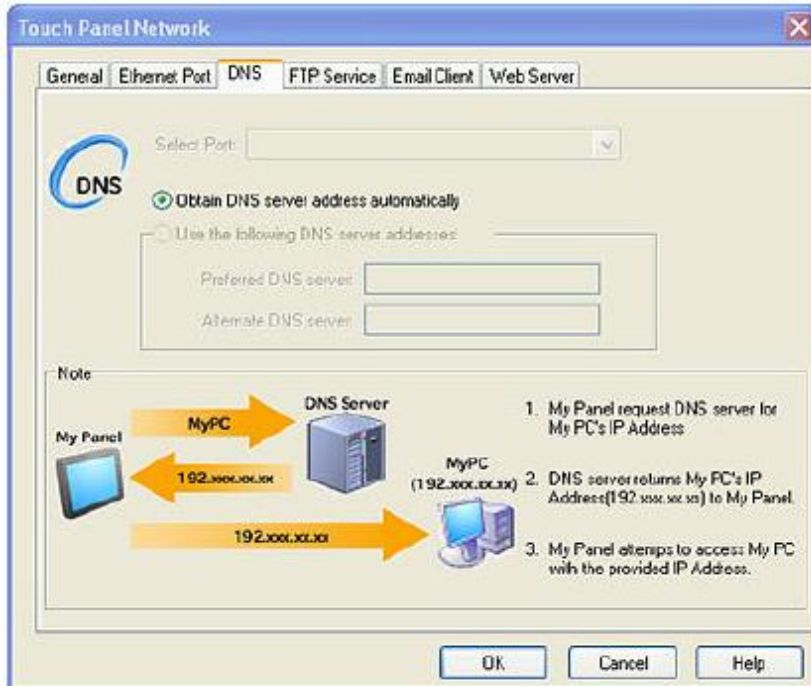


Recoverable energy solutions  
through Rankine cycle based  
machines

Installation consultancy  
Machine maintenance ORC  
Machine exploitation ORC

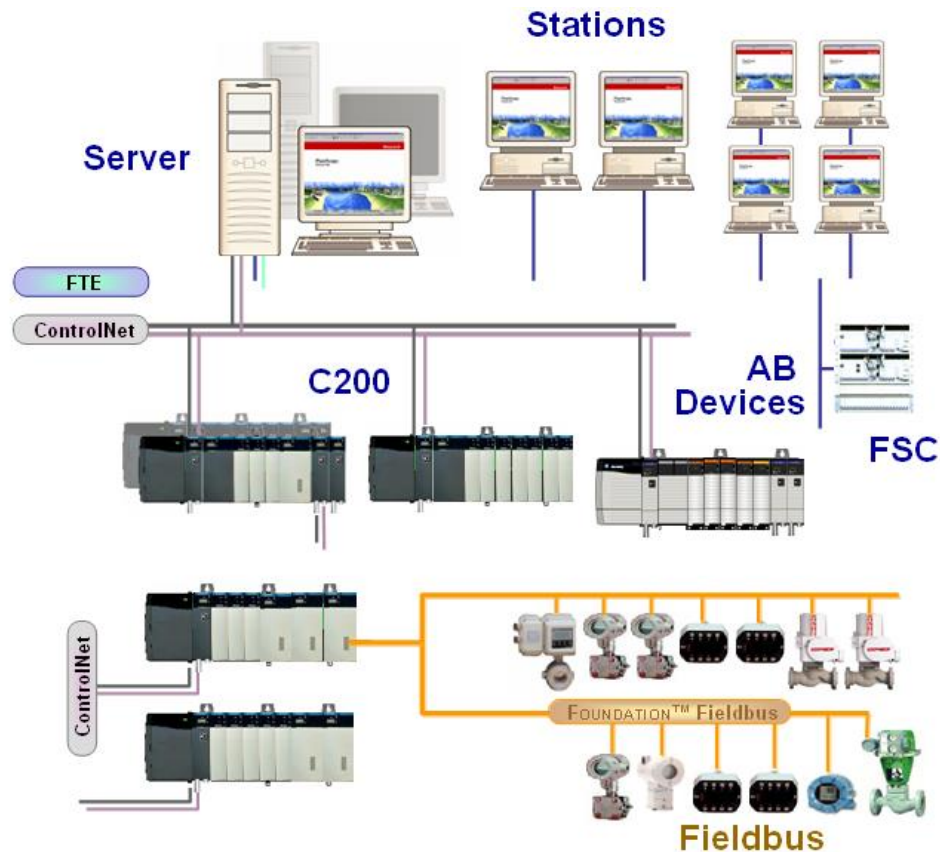


# Remote control and periodic maintenance ORC machine.



# Distributed control systems (DCS) in Refineries

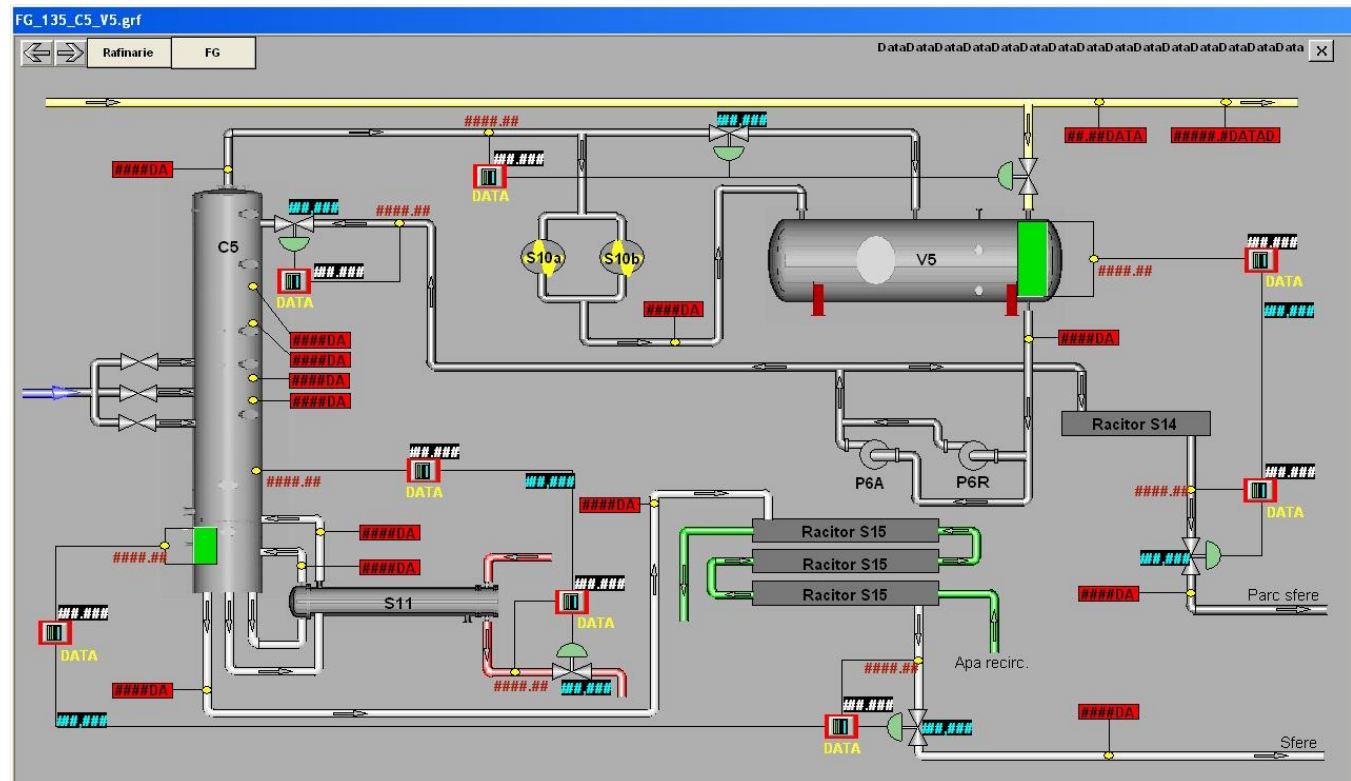
Control system architecture





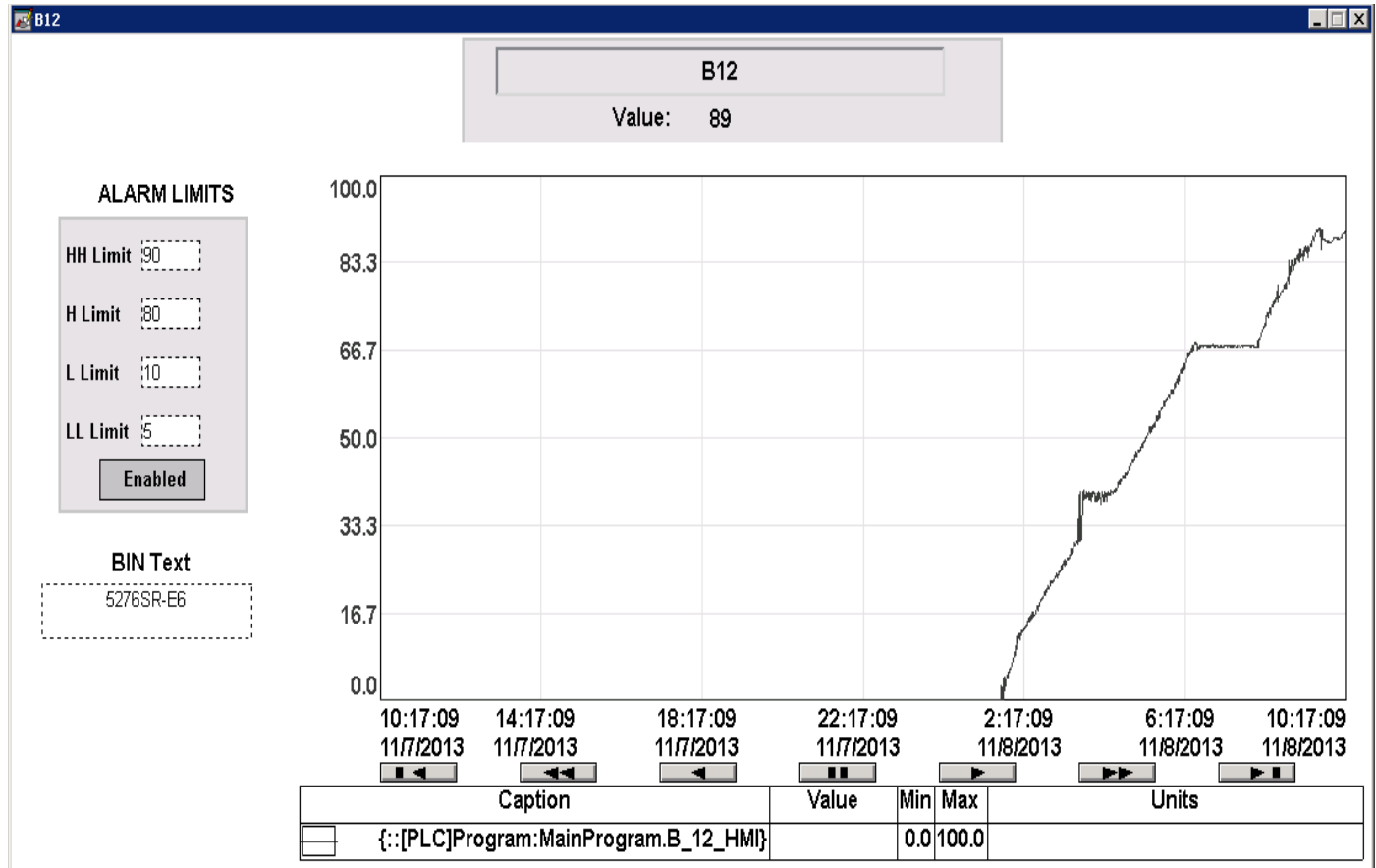
# Distributed control systems (DCS) - RomPetrol

Human Machine Interface (HMI) - example



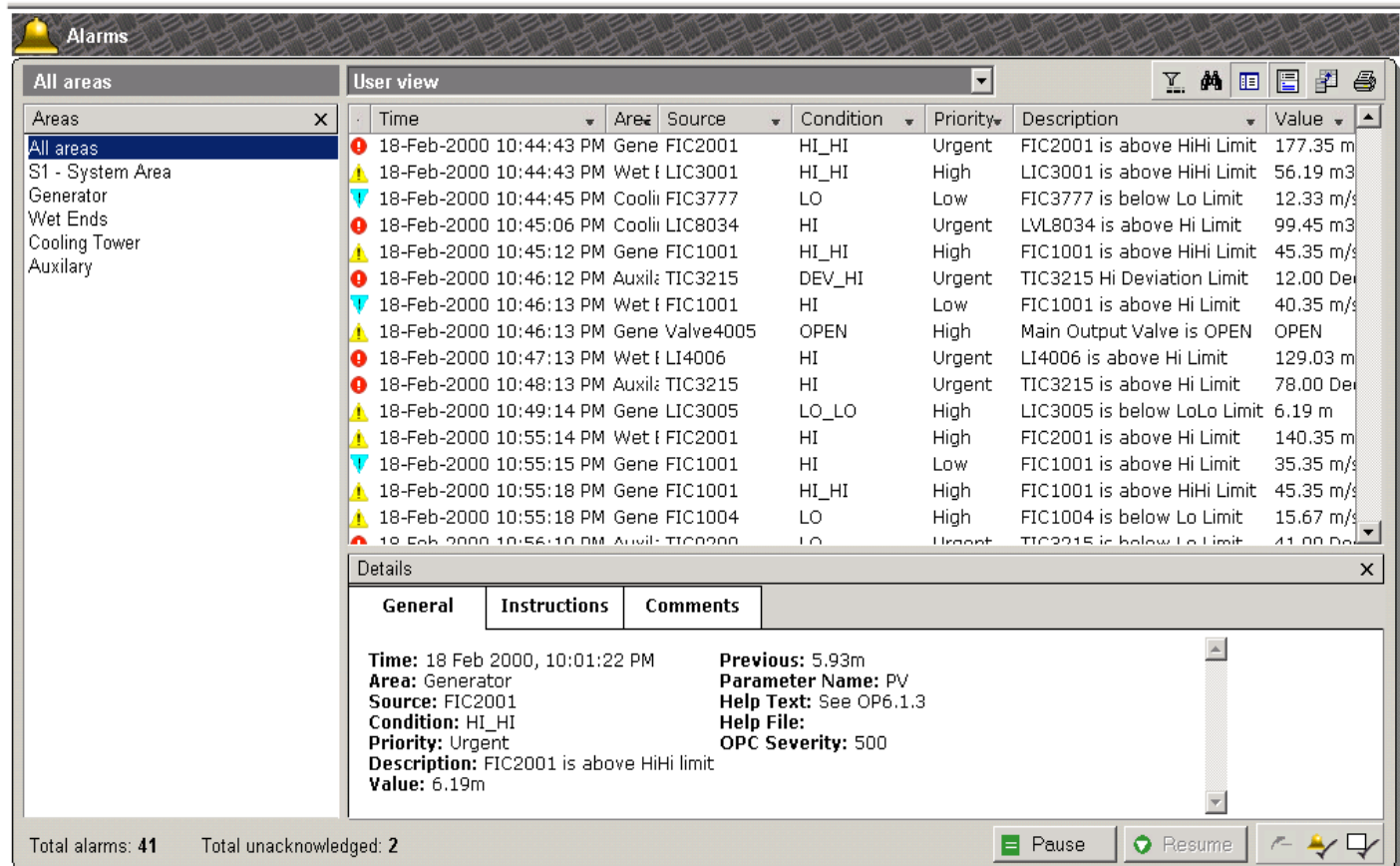
## Distributed control systems (DCS)

Continuous  
 Historical  
 trends



# Distributed control systems (DCS)

Alarms,  
Events  
recording  
definitions and  
showing



The screenshot shows a software interface for monitoring alarms. The main window is titled 'Alarms' and has a 'User view' dropdown. On the left, there is a tree view of 'All areas' including 'S1 - System Area', 'Generator', 'Wet Ends', 'Cooling Tower', and 'Auxiliary'. The main area displays a table of active alarms with columns for Time, Area, Source, Condition, Priority, Description, and Value. A 'Details' window is open at the bottom, showing information for a specific alarm.

Time	Area	Source	Condition	Priority	Description	Value
18-Feb-2000 10:44:43 PM	Gene	FIC2001	HI_HI	Urgent	FIC2001 is above HiHi Limit	177.35 m
18-Feb-2000 10:44:43 PM	Wet f	LIC3001	HI_HI	High	LIC3001 is above HiHi Limit	56.19 m3
18-Feb-2000 10:44:45 PM	Coolin	FIC3777	LO	Low	FIC3777 is below Lo Limit	12.33 m/s
18-Feb-2000 10:45:06 PM	Coolin	LIC8034	HI	Urgent	LVL8034 is above Hi Limit	99.45 m3
18-Feb-2000 10:45:12 PM	Gene	FIC1001	HI_HI	High	FIC1001 is above HiHi Limit	45.35 m/s
18-Feb-2000 10:46:12 PM	Auxil:	TIC3215	DEV_HI	Urgent	TIC3215 Hi Deviation Limit	12.00 Dev
18-Feb-2000 10:46:13 PM	Wet f	FIC1001	HI	Low	FIC1001 is above Hi Limit	40.35 m/s
18-Feb-2000 10:46:13 PM	Gene	Valve4005	OPEN	High	Main Output Valve is OPEN	OPEN
18-Feb-2000 10:47:13 PM	Wet f	LI4006	HI	Urgent	LI4006 is above Hi Limit	129.03 m
18-Feb-2000 10:48:13 PM	Auxil:	TIC3215	HI	Urgent	TIC3215 is above Hi Limit	78.00 Dev
18-Feb-2000 10:49:14 PM	Gene	LIC3005	LO_LO	High	LIC3005 is below LoLo Limit	6.19 m
18-Feb-2000 10:55:14 PM	Wet f	FIC2001	HI	High	FIC2001 is above Hi Limit	140.35 m
18-Feb-2000 10:55:15 PM	Gene	FIC1001	HI	Low	FIC1001 is above Hi Limit	35.35 m/s
18-Feb-2000 10:55:18 PM	Gene	FIC1001	HI_HI	High	FIC1001 is above HiHi Limit	45.35 m/s
18-Feb-2000 10:55:18 PM	Gene	FIC1004	LO	High	FIC1004 is below Lo Limit	15.67 m/s
18-Feb-2000 10:56:10 PM	Auxil:	TIC3215	LO	Urgent	TIC3215 is below Lo Limit	41.00 Dev

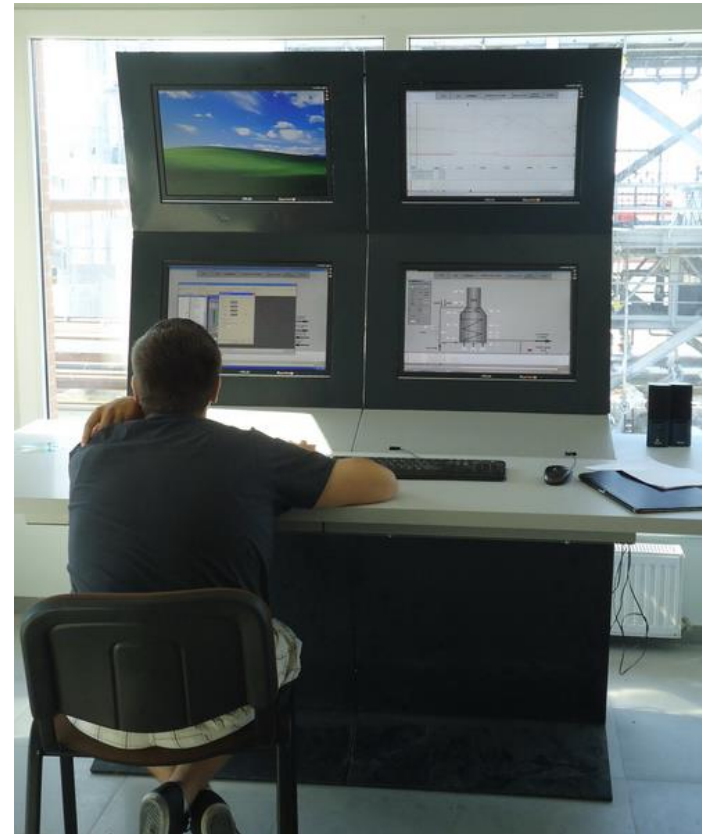
  

General	Instructions	Comments
<b>Time:</b> 18 Feb 2000, 10:01:22 PM <b>Area:</b> Generator <b>Source:</b> FIC2001 <b>Condition:</b> HI_HI <b>Priority:</b> Urgent <b>Description:</b> FIC2001 is above HiHi limit <b>Value:</b> 6.19m		<b>Previous:</b> 5.93m <b>Parameter Name:</b> PV <b>Help Text:</b> See OP6.1.3 <b>Help File:</b> <b>OPC Severity:</b> 500

Total alarms: 41    Total unacknowledged: 2

# Distributed control systems (DCS)

- Automation of a distillation column
- Continuous control of process values



# Distributed control systems (DCS)

Automation cabinet and system characteristics:

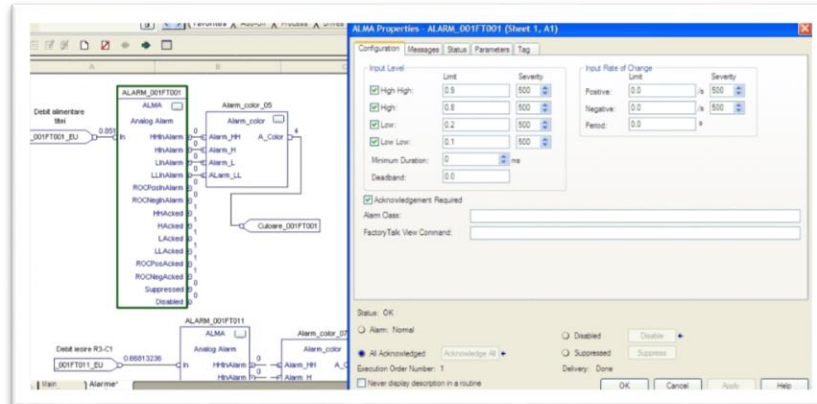
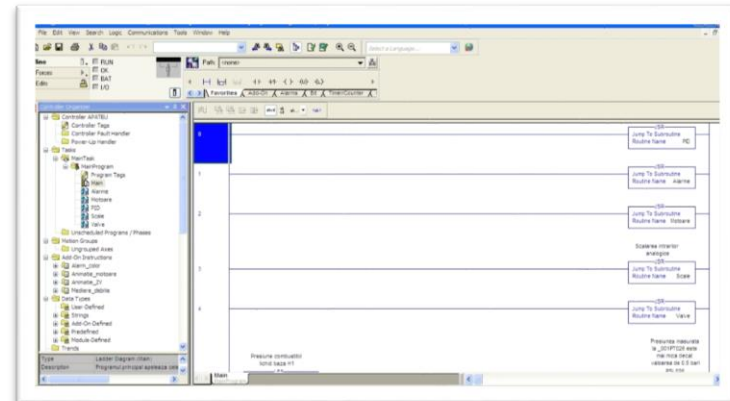
- DCS design
- Control strategies implementation
- HMI operation
- ESD systems
- Compressors control systems



# Distributed control systems (DCS)

Implementation routines:

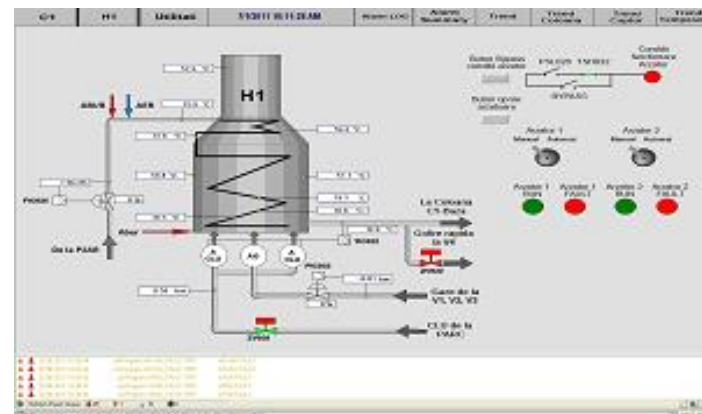
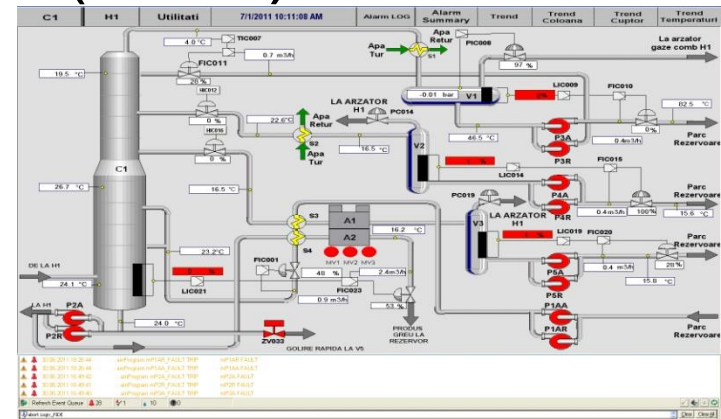
- Alarms
- Scaling
- PID
- Motor control
- Valve control



# Distributed control systems (DCS)

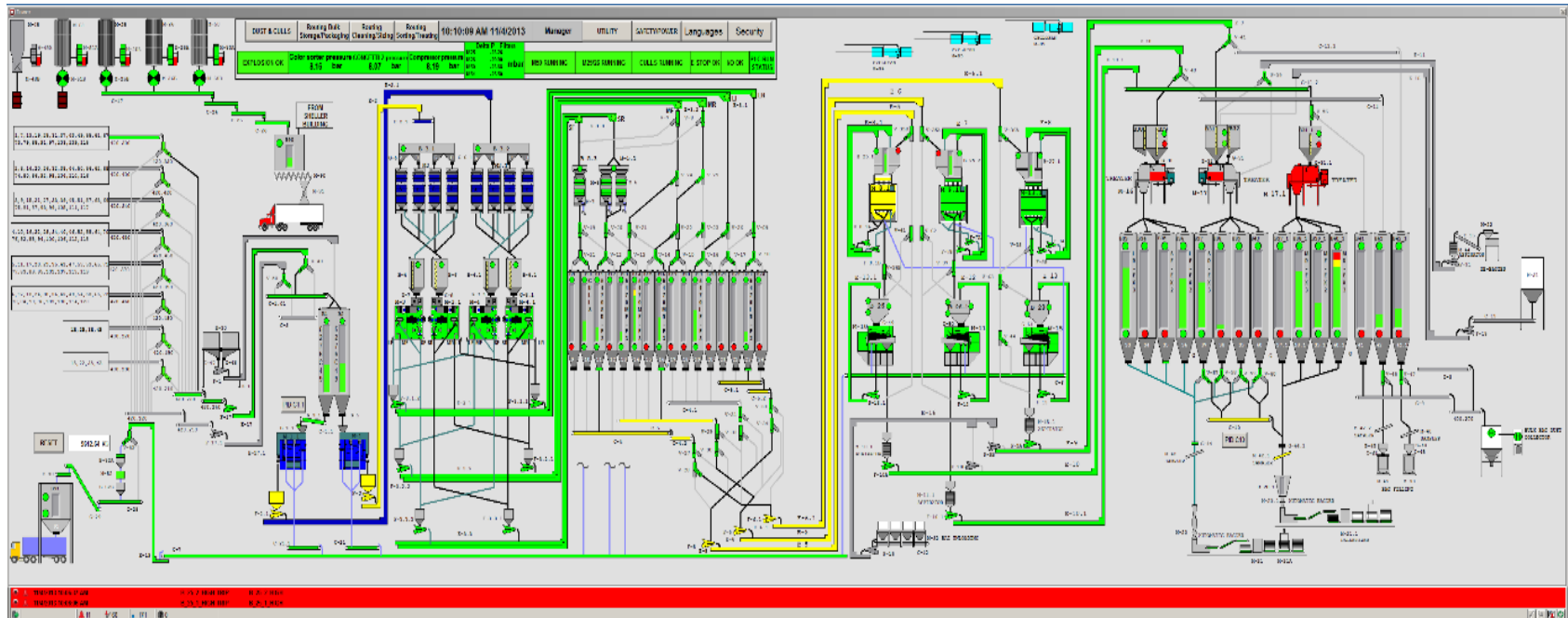
User interface:

- Synoptic schemes
- Alarms Faceplate, PID-s
- Alarms Banner (ACK possibility, reset etc)
- Color animation (În caz de avarie etc.)
- Fill Animation for tanks and analogic valves command



# Distributed control systems

## Calibration and treatment tower Monsanto Romania

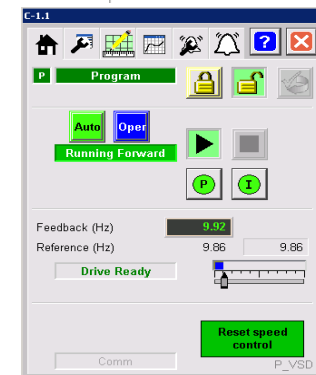
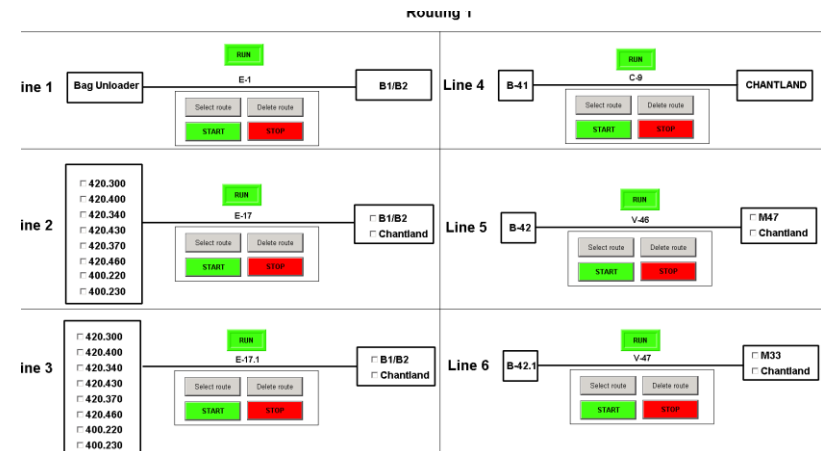




# Distributed control systems

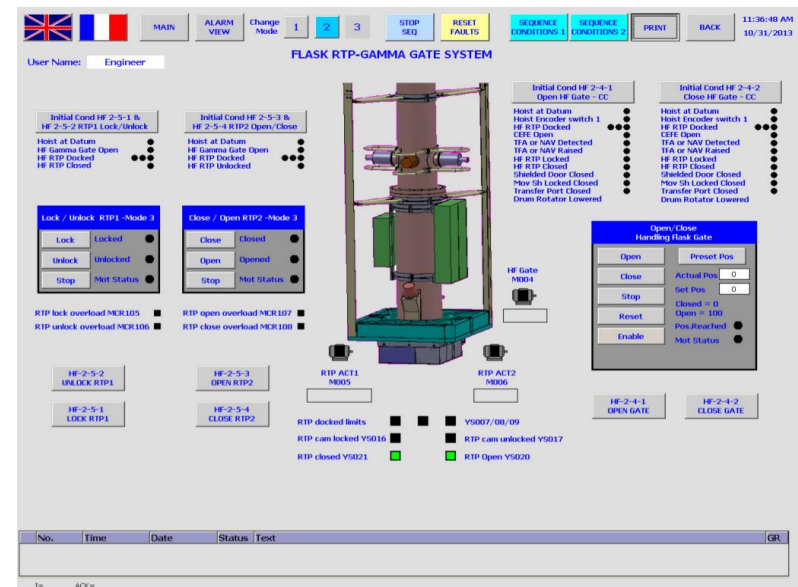
## Calibration and treatment tower Monsanto Romania

- Safety controller for emergency shutdown;
- Communication redundancy by fiber optic ring;
- Remote I/O for each level of the tower with redundant communication port;
- SCADA server with 2 clients for redundancy;
- Automatic routing from feeding lines to bagging lines;
- PID regulators for seed bunkers;
- Multilanguage SCADA application;



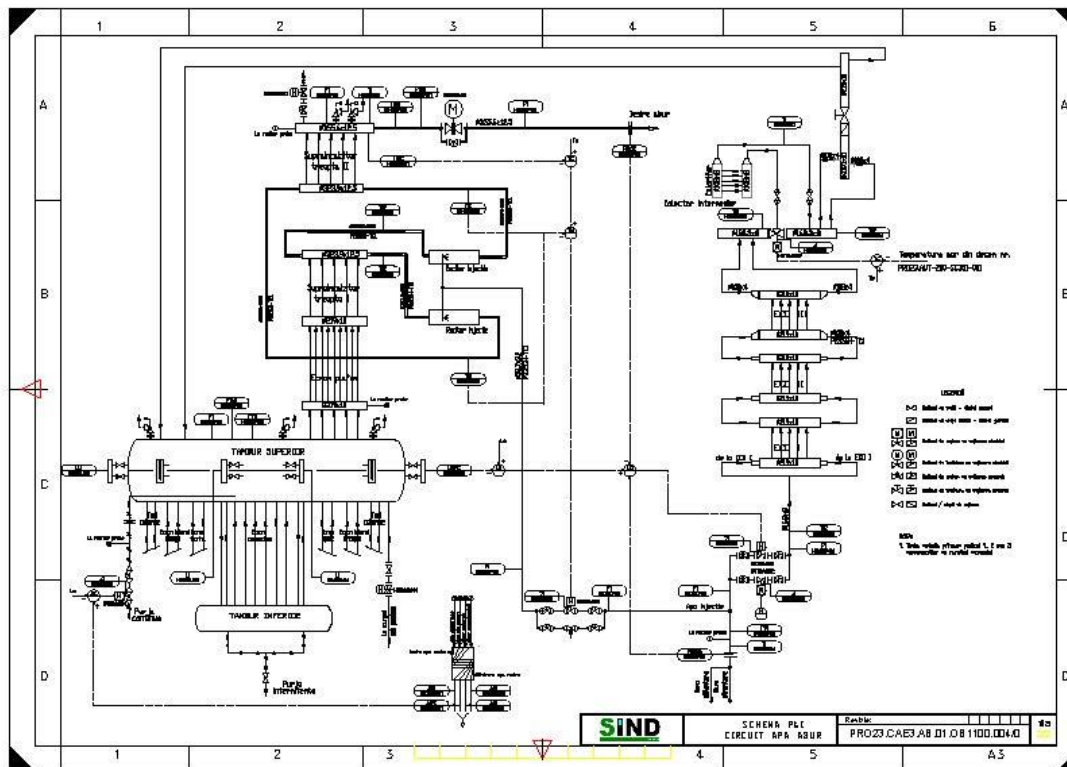
# Control station for decommissioning of nuclear power station at Brennilis France

- Removal, processing and disposal of used fuel rods from reactor;
- Precise motor control – both speed and position with the help of Encoders, counters and VSDs
- Multiple control stations across different height levels, using ProfiNet and Wireless communication architecture



# Control System Design and Implementation

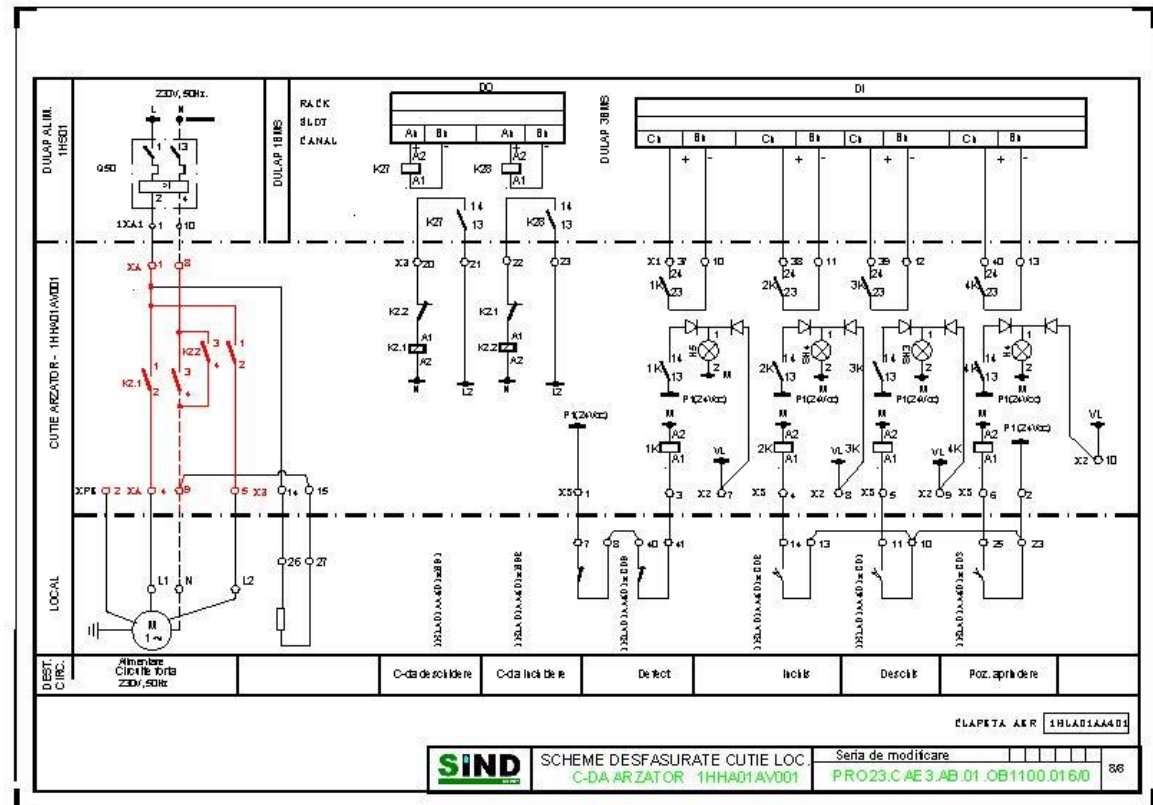
❖ P&I drawing with all instrumentation and controls



# Control System Design and Implementation

## ❖ Wiring planning:

- JB'S
- Marshalling rack
- I/O card arrangement

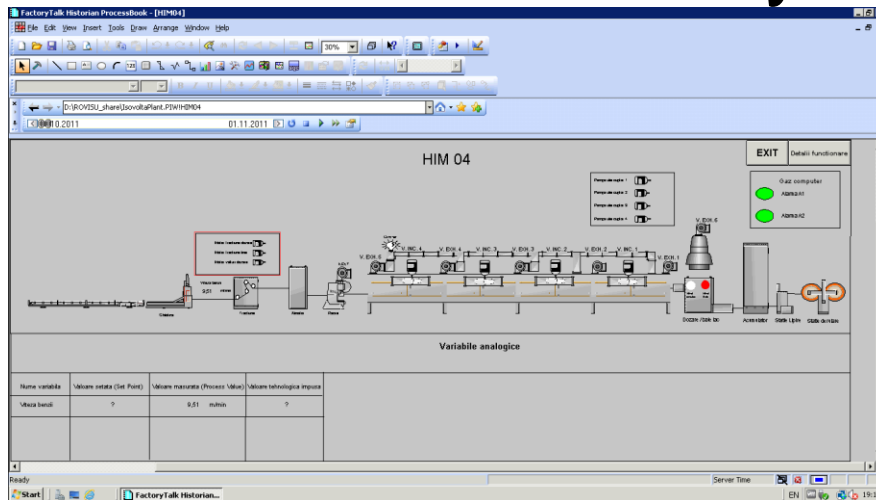


# Plant information systems

- Energy consumption management (terminal and electrical energy)
- Plant-Information redundant Sistem (FactoryTalk Historian)
- OPC server data acquisition from various manufacturers (Kepware, Endress+Hauser, etc)
- Various devices interconnections: PLCs, Electrical and Terminal Energy counter etc.

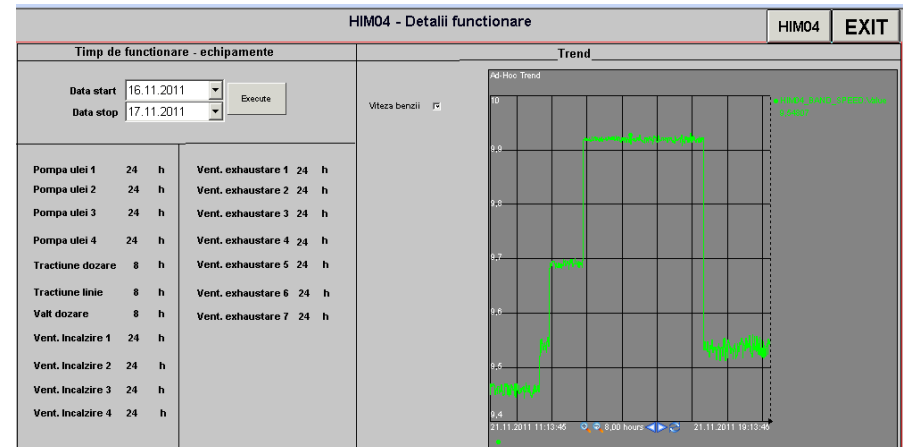


# Distributed control systems (DCS)



- User display configuration using ProcessBook with digital and analogic parameters presentation


- Equipment's working hours contabilisations and visualizations



# Energy consumption management, data reconciliations

Contor energie termica - Siempelkamp Twin Press (LPR04 & LPR07)

Aplicatie		Total	
Densitate	889 Kg/mc	Err. tot. debit	5634 t
Entalpie	358 KJ/kg	Err tot. debit caldura	1 MW/h
Debit	0 mc/h	Suma debit	24992 mc/h
Debit de caldura	0 MW	Suma caldura	1576 MW
Debit masic	0 Kg/h	Total debit	45494 mc/h
Temperatura 1	96 deg Celsius	Total caldura	1576 MW/h
Temperatura 2	179 deg Celsius	Total debit masic	22066 t



- Instantaneous value display of recorded counters values

- Detailed reports regarding consumption, working hours etc. using Datalink (Excel Add-on)

Hot water counters - Total consumption between period of time				
Date	START DATE		07.11.2011	
	END DATE		15.11.2011	
CC	Type	Description	Actual Index	Value (MW)
63201	Consumption	Phenol Resins R5	197,1799927	0,380004883
	Consumption	Phenol Resins R1	5408,680176	0,919921875
63042	Consumption	Pagnoni 3000	95774,39063	65,24121094
63056	Consumption	Siempelkamp 4000 (LPR01)	9332,620117	99,98925781
63143	Consumption	Siempelkamp 2x1 (LPR02)	6155,299805	7,99609375
63056	Consumption	Siempelkamp 5000 (LPR03)	571079,75	0
63158	Consumption	Siempelkamp Twin Press (LPR 07)	1576	0,050048828
63151	Consumption	Siempelkamp Twin Press (LPR 04)		

# Industrial communication Protocols

- Ethernet/IP
- ModBus
- ProfiBus
- MBus
- DeviceNet







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Bucharest, Romania

## Clients Portfolio

- Rompetrol
- Laromet
- EcoAqua
- ElectraTherme
- Germino
- Agrisol
- Metitex
- Isovolta
- Vest Petrol Rafinare
- Oltina
- Conpet