



EFFICIENCY FOR SURVIVAL



Grand Hyatt Nusa Dua, Bali
2013, Sept. 15- 19th

BDF INDUSTRIES' EFFICIENCY IMPROVEMENT PHILOSOPHY

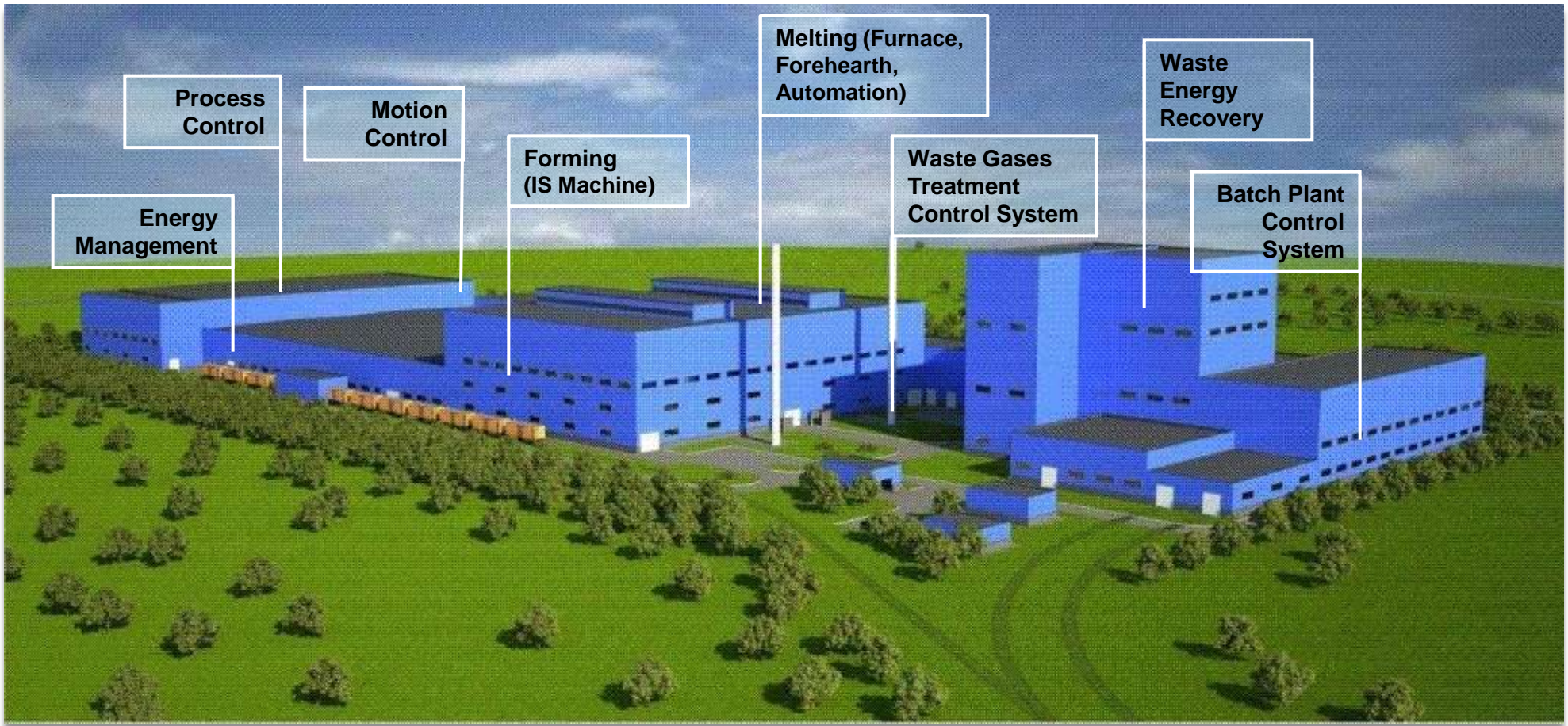
Efficiency depends on the whole glass plant's activities

To achieve the best efficiency level



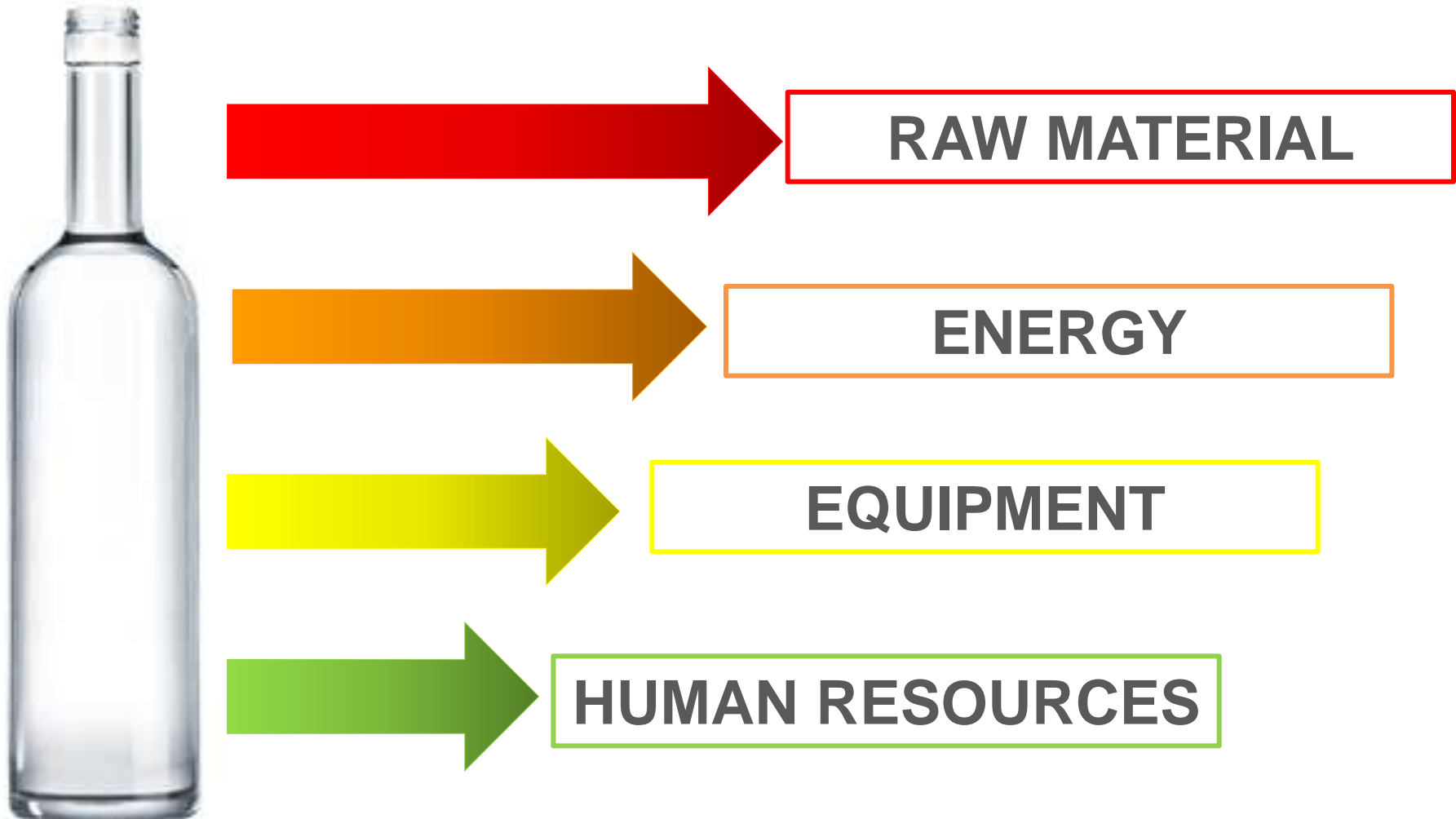
**ALL PRODUCTION PROCESS AREAS
CAN BE IMPROVED**

BDF INDUSTRIES' EFFICIENCY IMPROVEMENT PHILOSOPHY



BDF INDUSTRIES' EFFICIENCY IMPROVEMENT PHILOSOPHY

Important **key factors** are involved in the definition of production costs in a glass plant



ENERGY SAVING

AFE
Active Front End



IS Machine's
Servo Mechanisms



ENERGY
RECOVERY



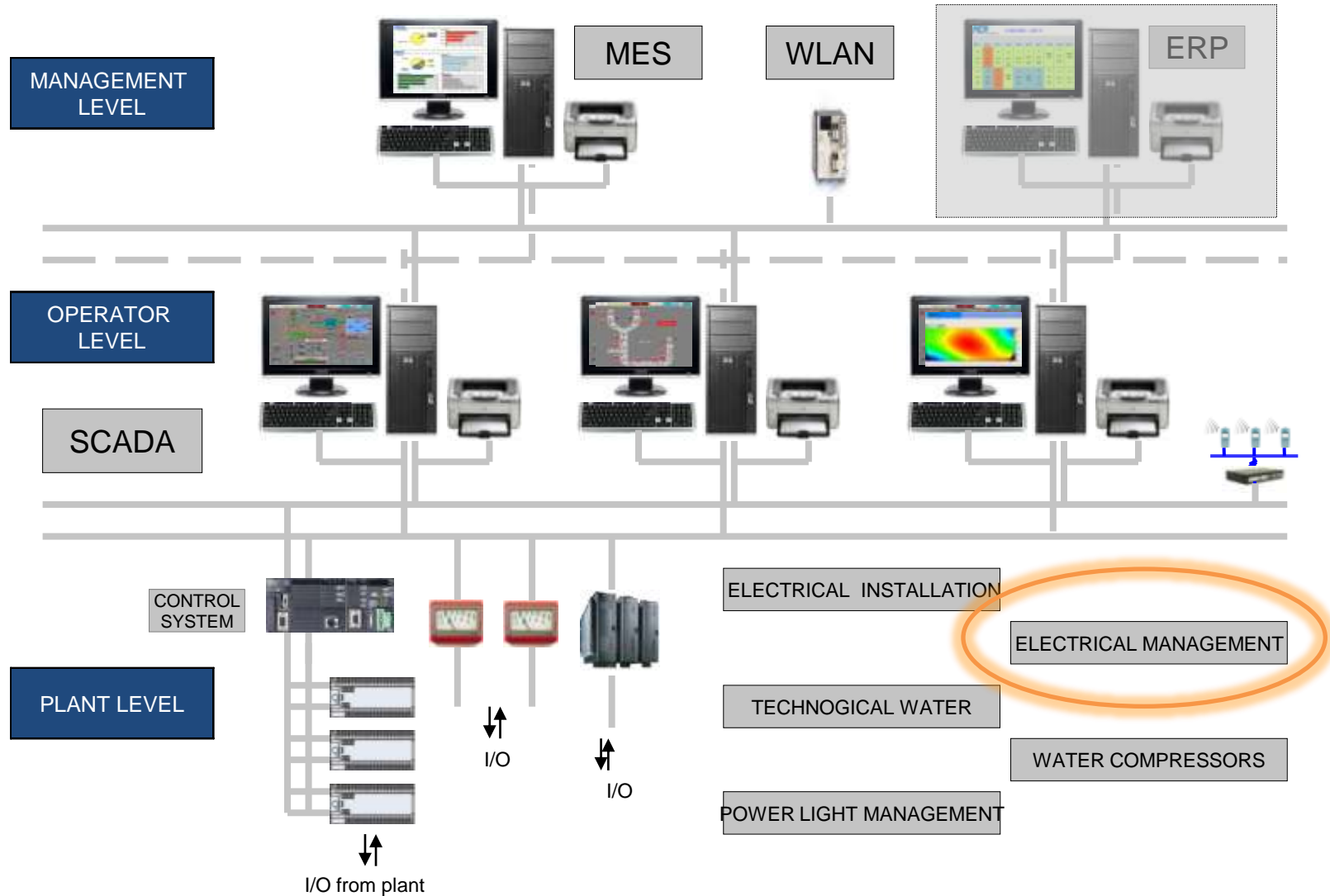
Heat Exchanger systems
ORC power recovery plant
Heating/Cooling and Water
Treatment



ENERGY MANAGEMENT



PLANT UTILITIES CONTROL



ELECTRICAL MANAGEMENT

GENERAL MENU

SPECIFIC MENU

GLASS LEVEL
0.02 (mm)

REVERSAL TIME
LEFT: **30:00** RIGHT: **25:08**

09:43:00 AM
09/23/2011

MCR Systems
GENOVA - ITALY

Low Voltage Cabin

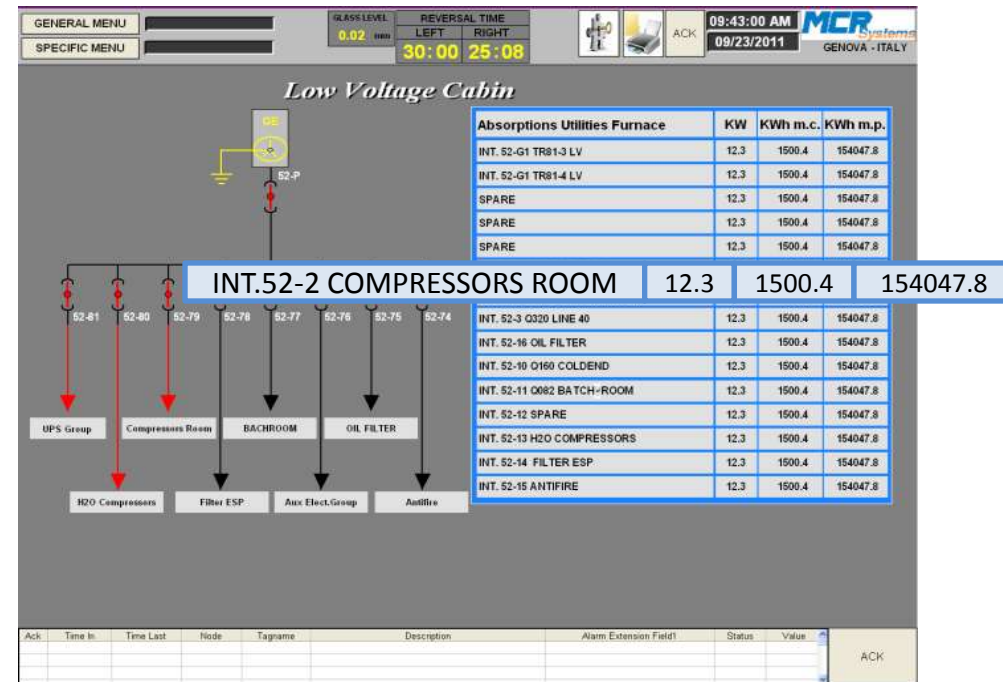
Absorptions Utilities Furnace	KW	KWh m.c.	KWh m.p.
INT. 52-G1 TR81-3 LV	12.3	1500.4	154047.8
INT. 52-G1 TR81-4 LV	12.3	1500.4	154047.8
SPARE	12.3	1500.4	154047.8
SPARE	12.3	1500.4	154047.8
SPARE	12.3	1500.4	154047.8
INT. 52-G1 TR81-5 LV	12.3	1500.4	154047.8

INT.52-2 COMPRESSORS ROOM	12.3	1500.4	154047.8
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Ack	Time In	Time Last	Node	Tagname	Description	Alarm Extension Field1	Status	Value

ELECTRICAL MANAGEMENT

- ✓ BDF Compressor Control System based on **master/slave management**
- ✓ The Compressor System maintains a **constant air collector pressure** independently to the utilities' compressed air requirements
- ✓ Better results achieved with **multiple/multibrand compressors**



ELECTRICAL MANAGEMENT



COMPRESSORS CONTROL SYSTEM - CASE HISTORY

WHERE

Intervention on 3.5bar line

No.2 **fully loaded** compressors – No.1 **50% loaded** compressor

HOW

PLC system to manage and optimize 3.5bar line compressors' operations

FINAL OBJECTIVE

Reduction of Electric Energy consumption on compressors system throughout optimization of Best Working Point



COMPRESSOR CONTROL SYSTEM - CASE HISTORY

TARGETS

MAINTENANCE REDUCTION

The **network** works at the best point of the loaded curve. **Maintainance activity** on each compressor is dramatically **reduced**.

ENERGY SAVING

Compressor network is **optimized** to operate always close to the **best efficiency point**.

FLEXIBILITY

The Compressor Control System allows to control and monitor **multiple/multibrand compressors**.

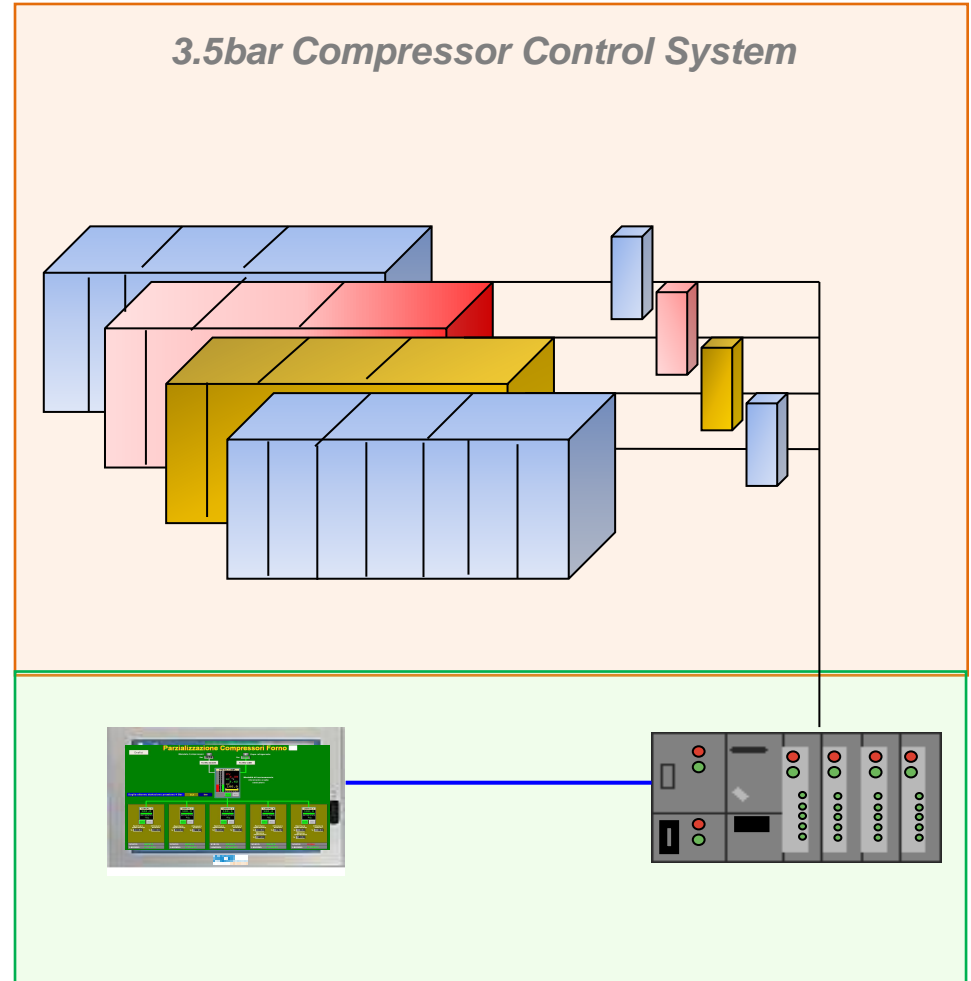
QUICK RETURN ON INVESTMENT



COMPRESSORS CONTROL SYSTEM - CASE HISTORY

ARCHITECTURE

The system manages the whole air compressors network, ensuring excellent performances **optimizing the working load** for each machine.

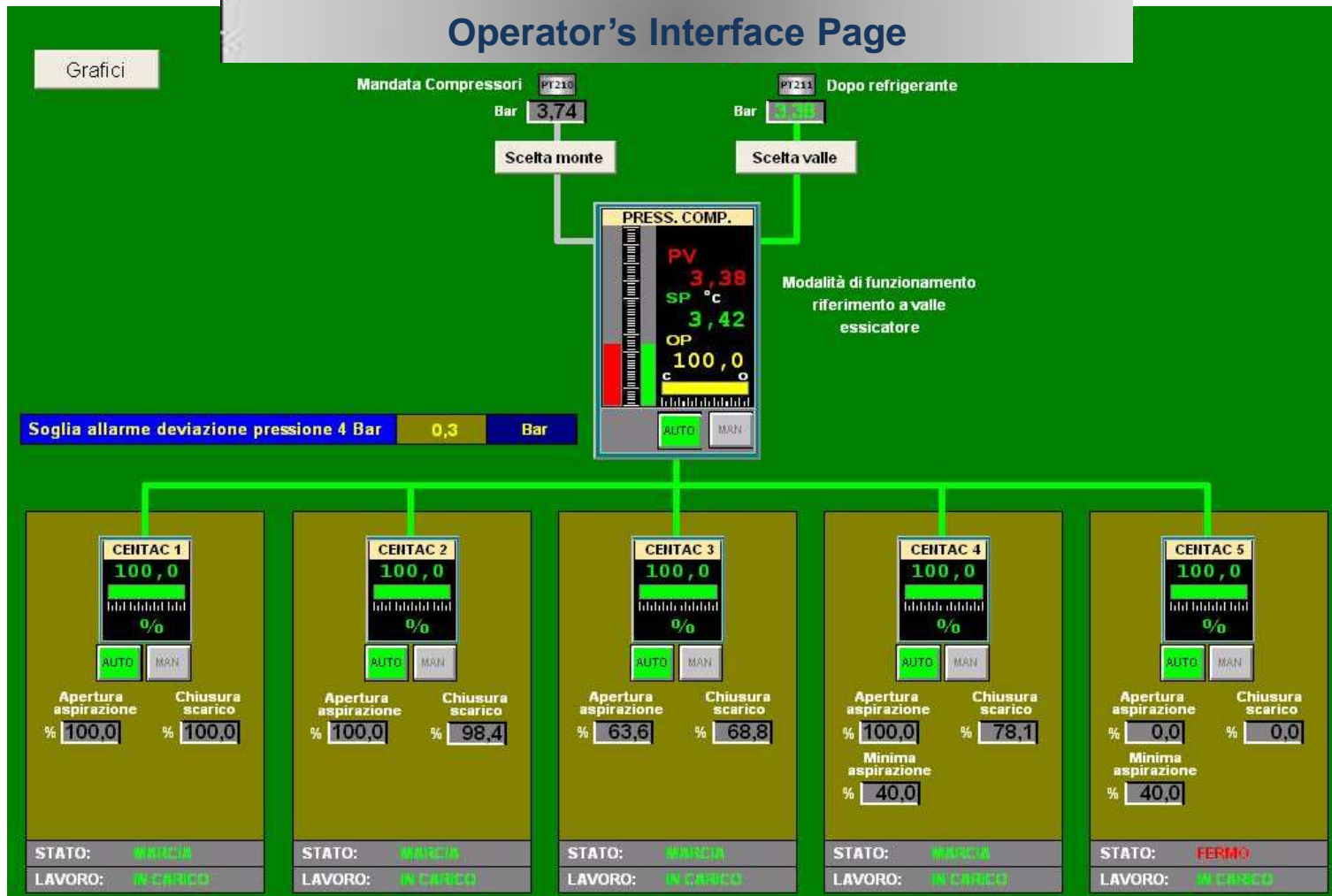


COMPRESSORS CONTROL SYSTEM - CASE HISTORY

DEVELOPMENT

- ✓ **Compressors system PLC** installed in the control room
- ✓ Junction box installed on each compressor with its own PLC
- ✓ 4-20mA position transmitters on valves' electro-pneumatic actuators
- ✓ Intake and exhaust valves controlled either by compressor's own PLC or by **compressors system PLC** (selector device)
- ✓ PID regulation pressure control transmitter on 3.5bar air collector – connected to **compressors system PLC** control panel –
- ✓ All compressors system data displayed and managed via dedicated PLC's control board
- ✓ Compressors control systems integrated on other control systems on demand

COMPRESSORS CONTROL SYSTEM - CASE HISTORY



COMPRESSORS CONTROL SYSTEM - CASE HISTORY

FINAL RESULTS

LOAD OPTIMIZATION

No. 3 **60%*** loaded compressors

ENERGY SAVING

Reduction of Electrical Energy up to **30%***

MAINTENANCE REDUCTION

Reduction of maintainance expenses up to **20%***



*After 2 years of operation



THANK YOU FOR YOUR ATTENTION

