PI System as an Aid for Prevention and Protection against Pollution
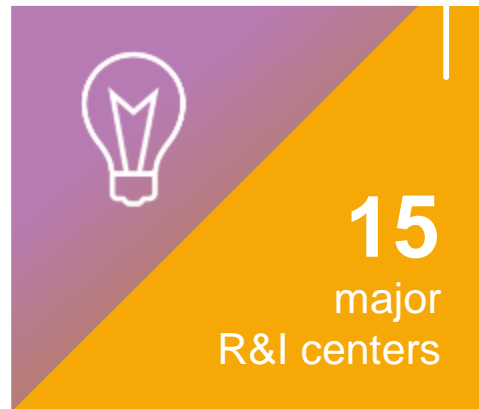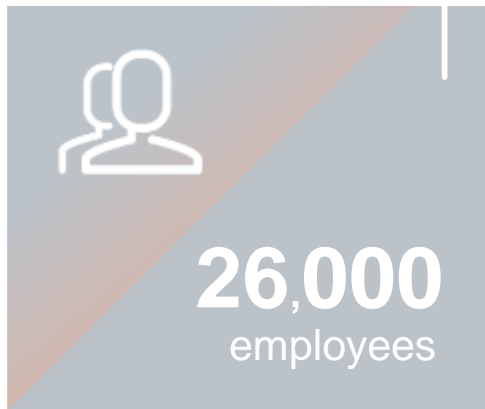
Presented by **Michele Albicocchi**

A world leader in the chemical industry

26,000 employees

119 industrial sites

15 major R&I centers

52 countries

€ 10,213 million of net sales

SOLVAY
asking more from chemistry®

2014 figures

A balanced presence in all growth regions

North America

23% of net sales

3,450 employees

28 industrial sites

2 major R&I centers

Latin America

11% of net sales

3,050 employees

10 industrial sites

1 major R&I center

Europe

34% of net sales

13,500 employees

52 industrial sites

8 major R&I centers

Asia-Pacific

32% of net sales

6,000 employees

29 industrial sites

4 major R&I centers

2014 figures

Rosignano factory

Historical notes
- **Building start 1912**
- **Production start 1917**

The factory occupies 2.2 km^2

- **Sales: 290 M€**

- **Investments and maintenance: 30 M€**

- **Directly emplyed people: 591 (2015)**
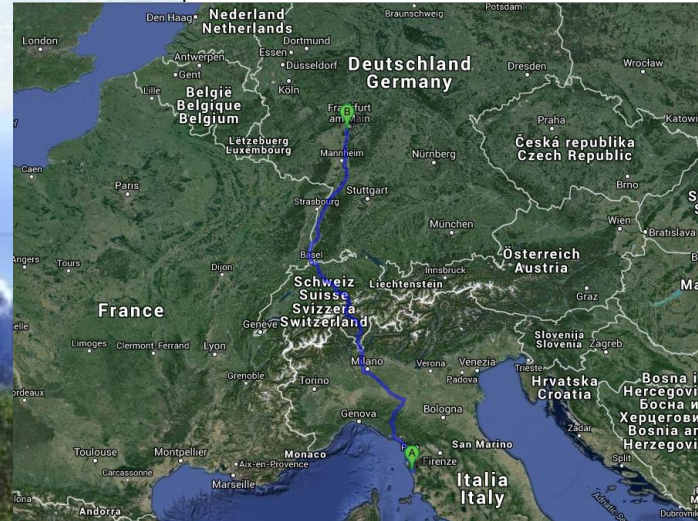
2013 figures

Production Capacity

Soda ash	**940 kT / year**
Sodium Bicarbonate	**260 kT / " "**
Calcium Chloride	**120 kT / " "**
Caustic Soda	**190 kT/ " "**
Chlorine and derivatives	**300 kT/ " "**
Hydrogen Peroxide	**35 kT / " "**
Sodium Percarbonate	**50 kT/ " "**

PI System as an Aid for Prevention and Control of Pollution

PI System tracks all warning or alarm events that must be justified by plant operators in the context of continuous improvement of plant environment impact and more over keeps people informed of the evolving situation.

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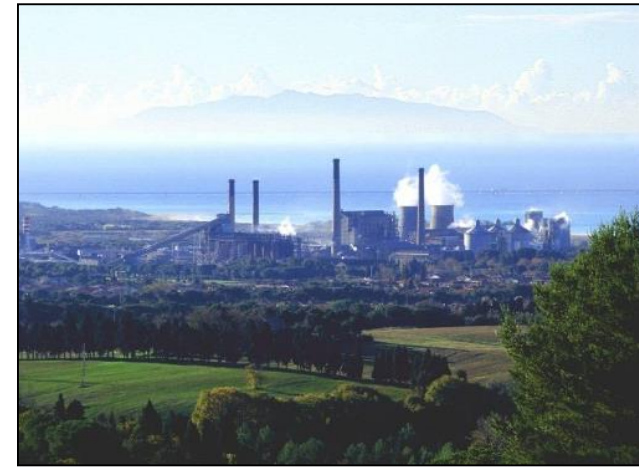
Business Challenge

Solution
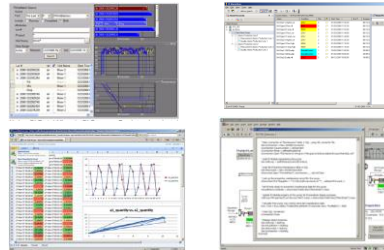
Results and Benefits
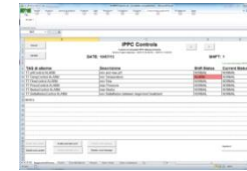
Integrated Pollution Prevention and Control (IPPC)

- **European Strategy to improve environmental performances**

- **European Directive 2008/1/EC and later 2010/75/EU**

- **List of Activities and Substances to keep under control**

- **Emission Limit Values based on Best Available Tech (BAT)**

- **Competent Authorities check all preventive pollution control measures have been laid down before granting a permit to any operation**

Variables under Control (IPPC)

Emissions

Temperature

Pressure

Redox

pH

Flow

Air
Water
Ground

Competent Authorities

Process Engineers
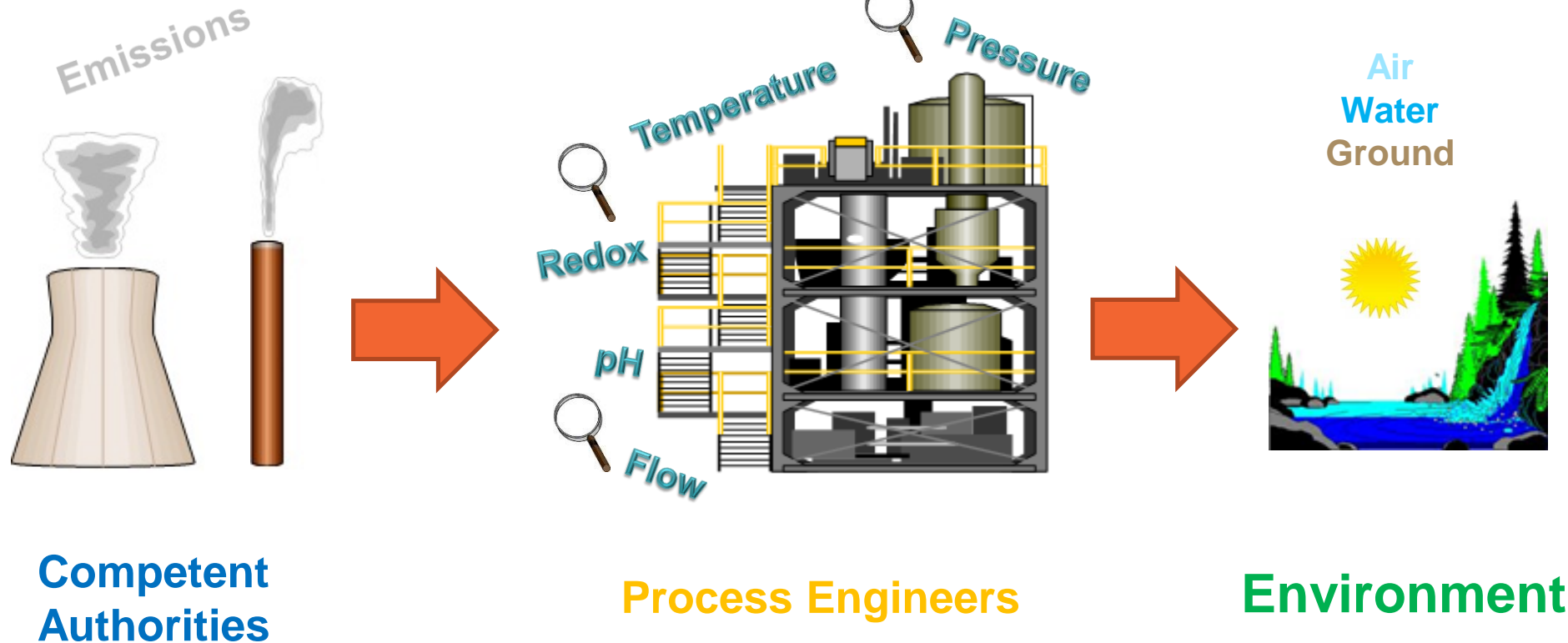
Environment

PI System as an aid to control pollution

Help for IPPC

It keeps under control those process parameters that have a direct influence on emissions related to IPPC permit

Help for Environmental Certification (ISO 14001)

By registering all abnormal conditions you can analyze them and set a process of continuous improvement

If you have an ISO 14001 certification you have a longer IPPC permit

Our solution (legacy PI System)

PI Server — To archive Process, Calculated and Alarm Tags
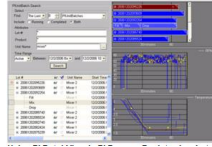
PI Batch — To register Events
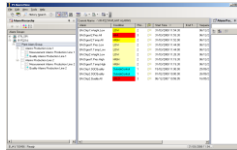
PI AlarmView — To notify control room conductors

PI DataLink — To report warning or alarm events
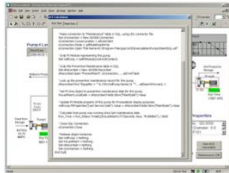
PI ACE — To send Alarm Notifications via e-mail/sms/etc.

Batch and Alarm Periods
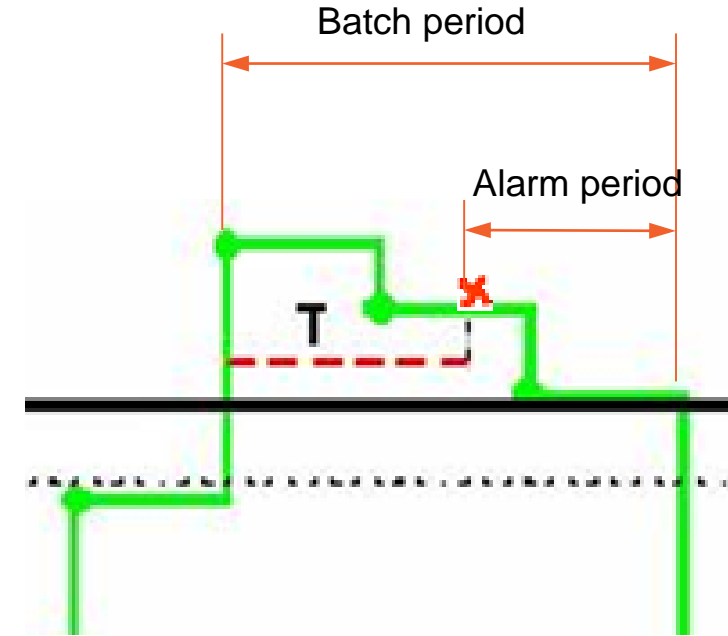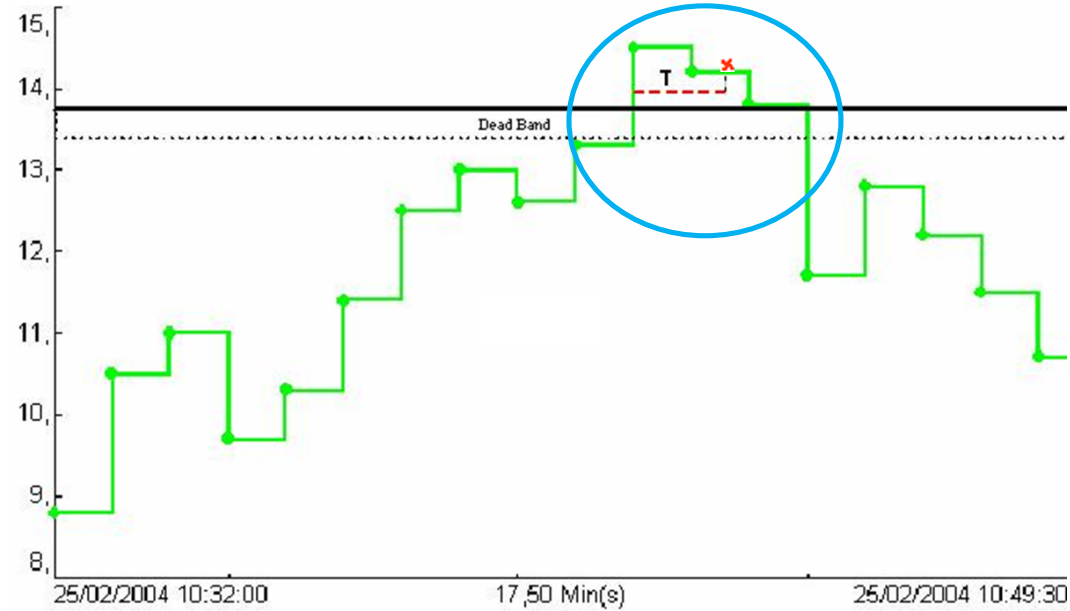
Batch and Alarm Periods

Alarm/Warning Periods

Possible risk for emissions

Intervention required

Δwarn
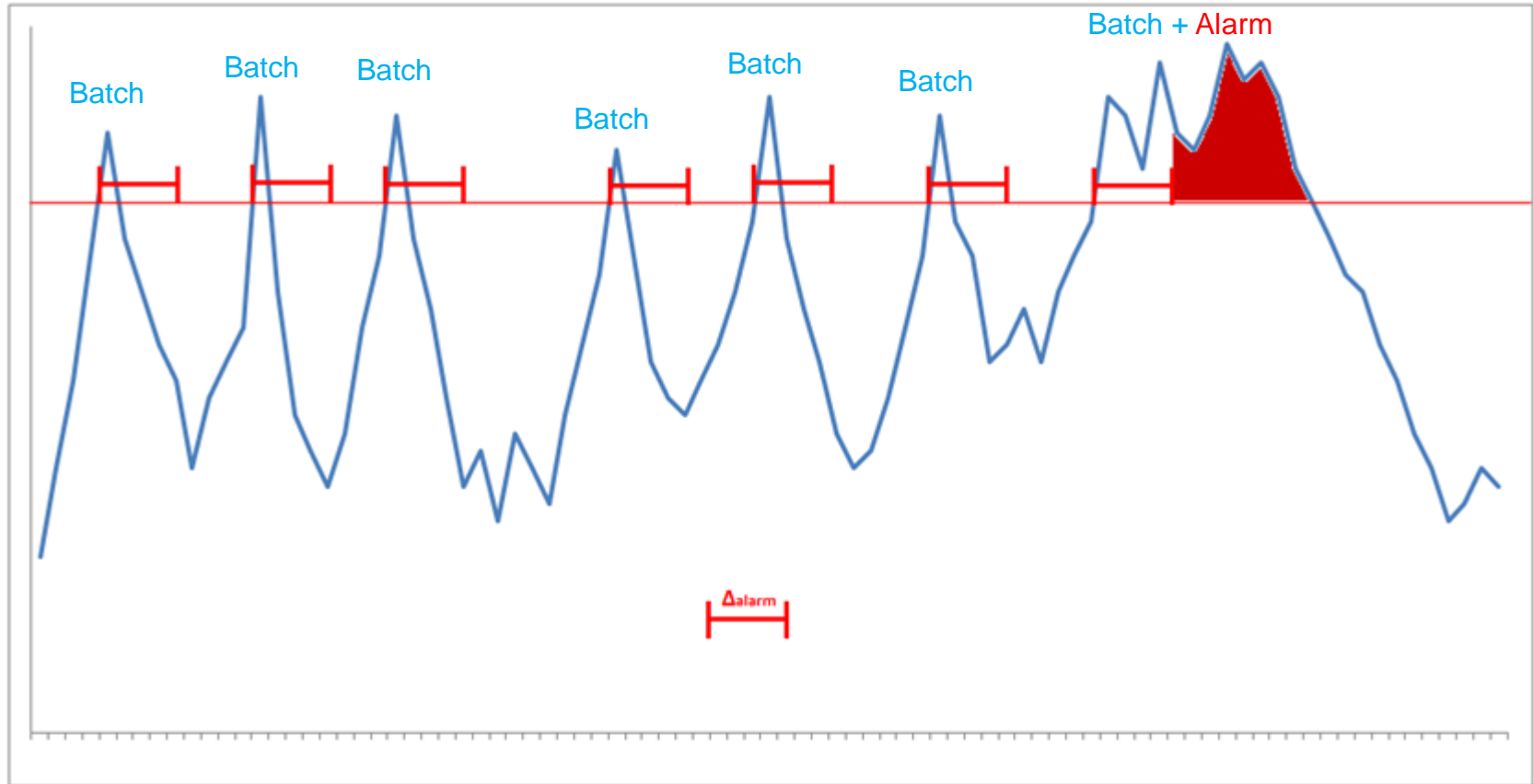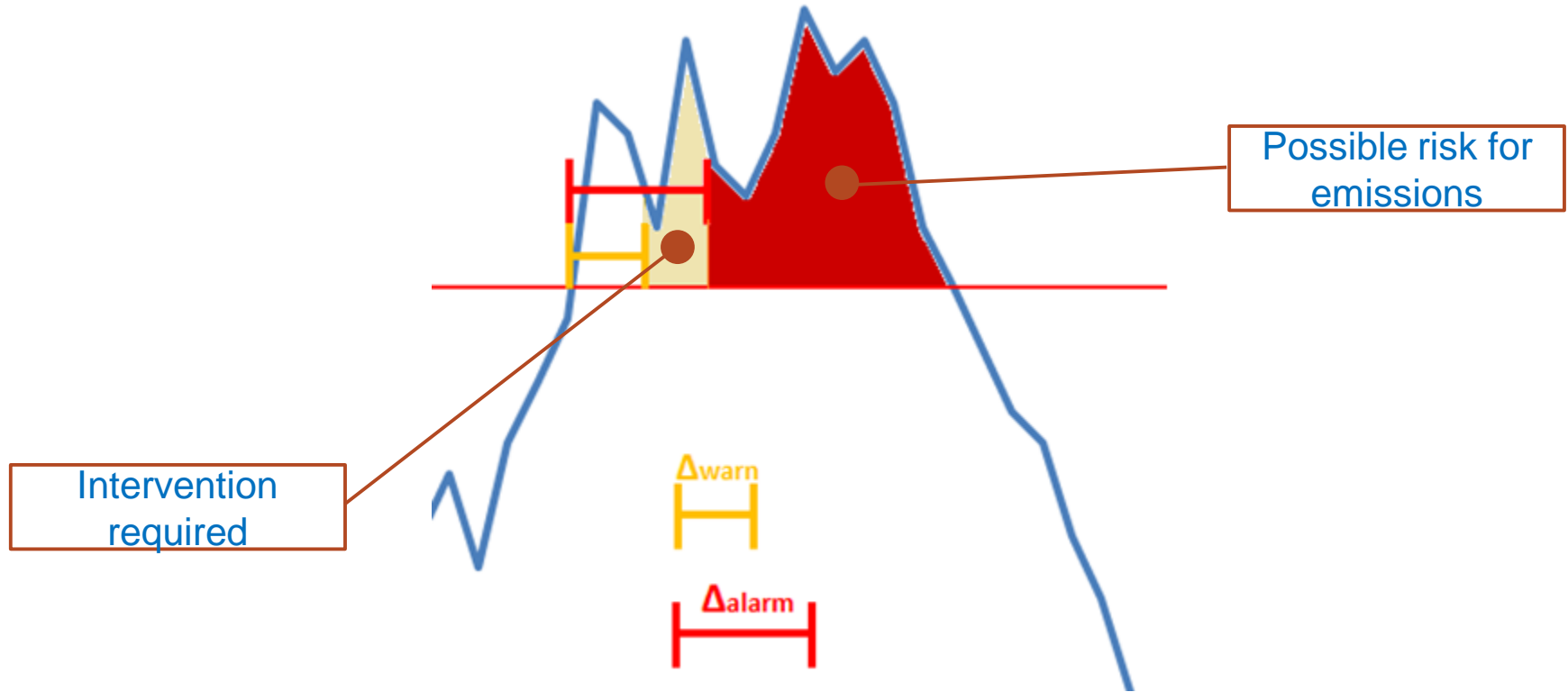
Δalarm

Warnings and Alarms differ only on the delay time (Δalarm > Δwarning)

Treatment Efficiency
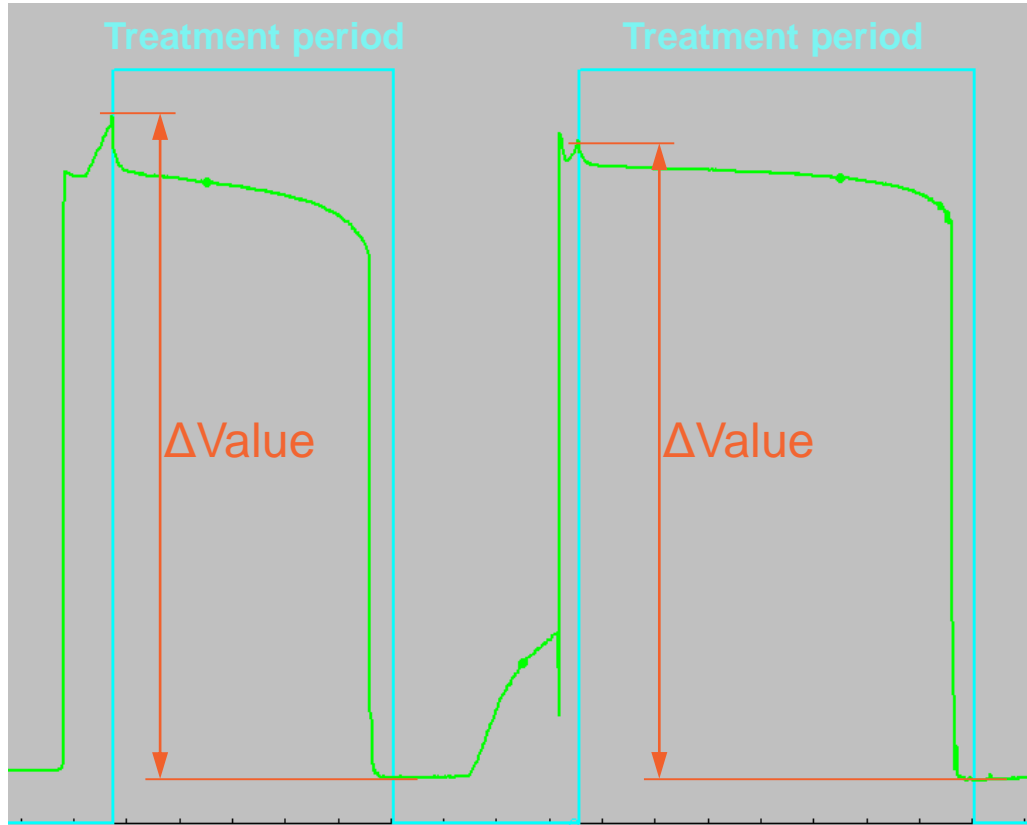
As an example, a Neutralization treatment is effective when a Delta Value is over a certain limit.

If ineffective, an alarm condition is kept from the end of the treatment until the beginning of the next one.

A similar control can be easily configured and reported in PI System. For configuration we mostly use PE and Alarm Tags.

PI AlarmView

Final users (like control room conductors) are also notified via PI AlarmView.

They must acknowledge any warning or alarm condition.

PI DataLink

Main MS Excel Book for Notification and Reporting.

Shift browsing (back/forth) buttons

Enable/Disable auto update

Enable/Disable automatic print

Enable/Disable vocal message

Alarm Status currently and during the selected shift

PI DataLink

We got the list of all alarm events in the selected shift.

Each event must be justified and discussed with process engineers to find out the reasons of abnormal behaviour.

PI DataLink + PI BatchView

Filter on Year and Lenght of Time

We use some reports to look at all events passing thresholds for any possible length of time.

Parameter under control

Results

Summary per month

18

Notification means

Send of e-mail with documents enclosed

PI ACE

Send of SMS

Alarm

Detection

Messages on the Screen

Setting Output Tags

Turning on
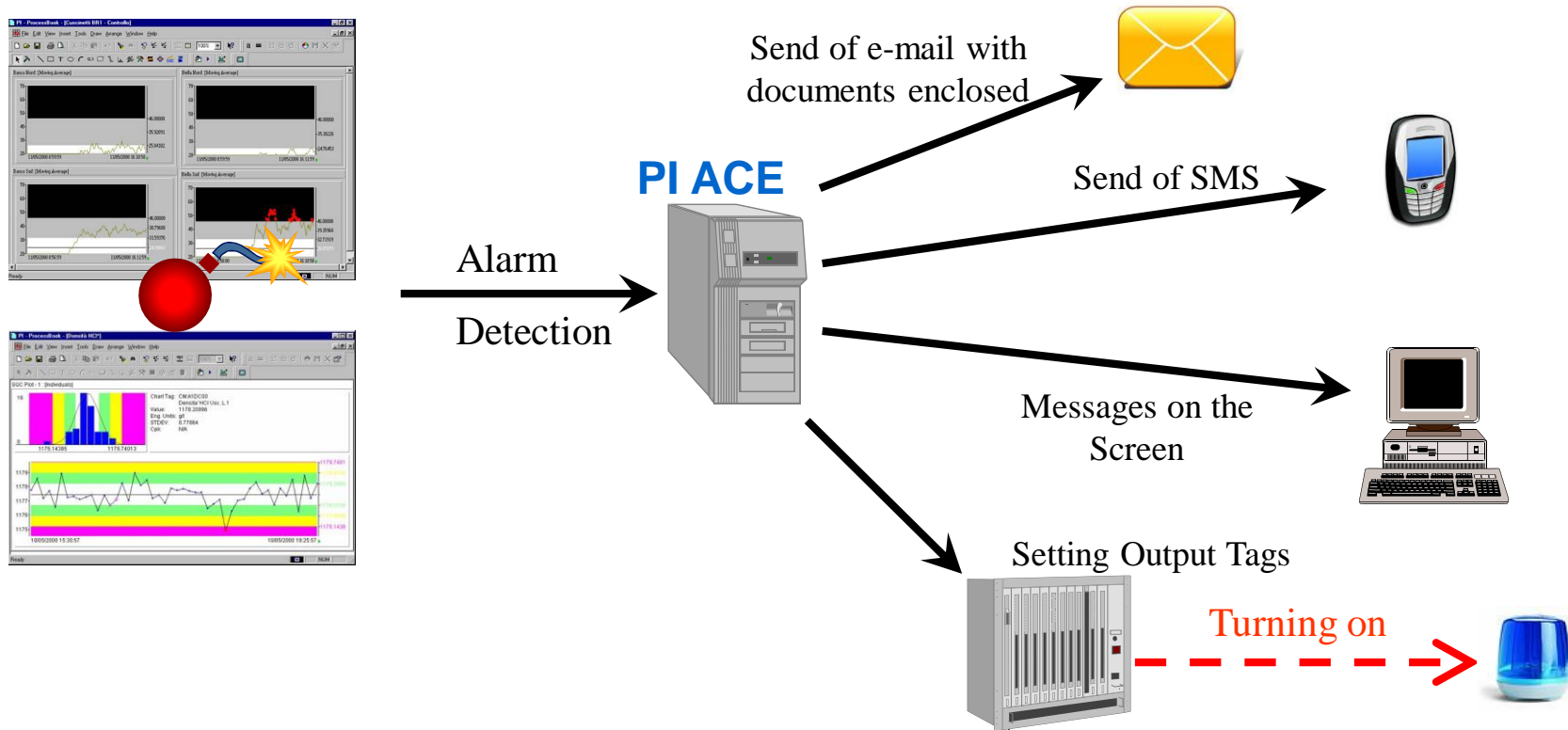
We built our PI ACE application when PI Notifications did not exist

PI System as an Aid in the Emergency

RAS is an Italian acronym for Factory Alarm Network, a computer system used to help communication in emergency situations

Based on an old version of Gensym-G2

Migrating towards PI system

Exploring PI AF/Event Frames + PI Notifications…

Emergency call for gas, fire. Main actors.
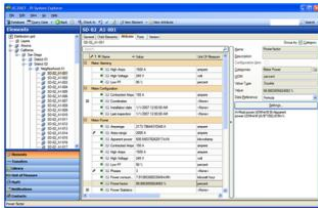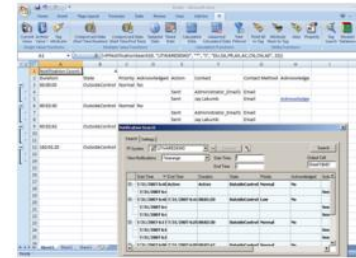
Plant of the accident

They inform the sentry post and the fire brigade (via RAS or by phone)

Sentry post

They inform auxiliary firemen and check acknowledgements

Control rooms

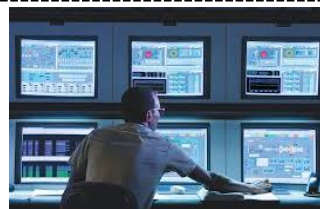They acknowledge the alarm and follow given instructions

Fire brigade

They acknowledge the alarm and reaches the place of the accident.
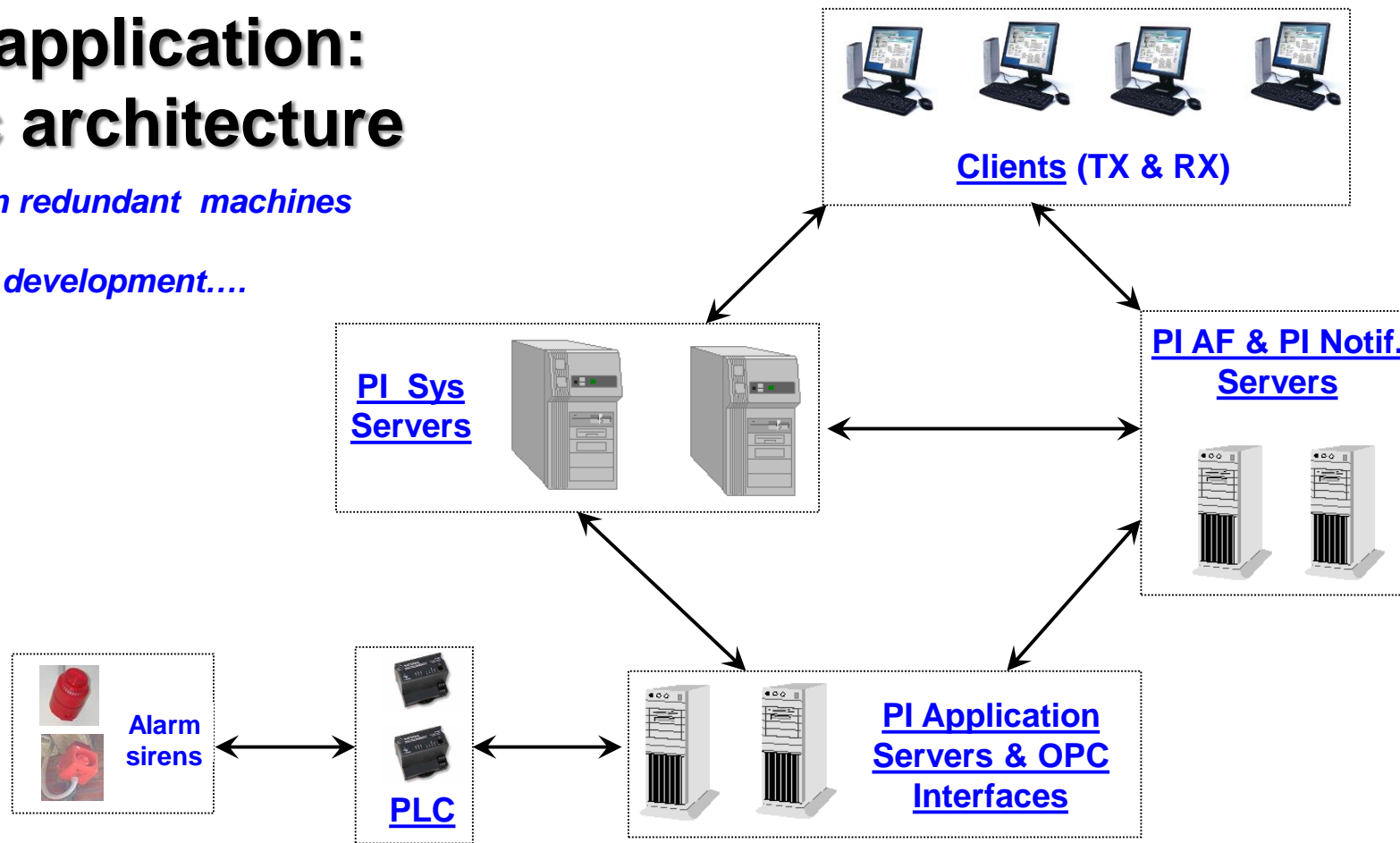

Operational Center

They make supervision and declare the end of the emergency. If necessary they inform local authorities.

RAS application: basic architecture

Based on redundant machines

In development….

Clients (TX & RX)

PI Sys Servers

PI AF & PI Notif. Servers

Alarm sirens

PLC

PI Application Servers & OPC Interfaces

Business is real time.

Safety is our first part of the business…

Michele Albicocchi

michele.albicocchi@solvay.com

Industrial IT Supervisor

Solvay Chimica Italia S.p.A.

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