PI System as an Aid for Prevention and Control of Pollution

Presented by **Michele Albicocchi**

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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 improvements of plant environment impact and more over keeps people informed of the evolving situation.

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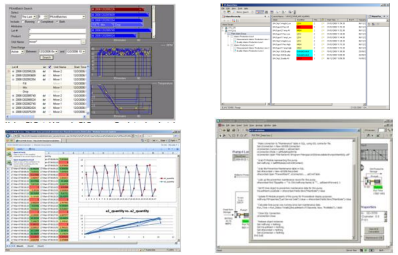
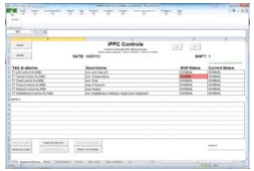
Business Challenge

Solution



Results and Benefits



Group profile – who we are

SOLVAY
asking more from chemistry®

A major global player in Chemicals with compelling strengths

Created by Ernest Solvay in 1863, Solvay is a **Global** company, with historical anchorage in Europe, and headquartered in Brussels.

Our strengths

- **90% of sales** in businesses among the **top 3 global leaders**
- **~ 40% of sales** in fast growing markets
- **Balanced portfolio** of activities
- A culture of **sustainability, innovation and operational excellence**

€12.4bn
NET SALES

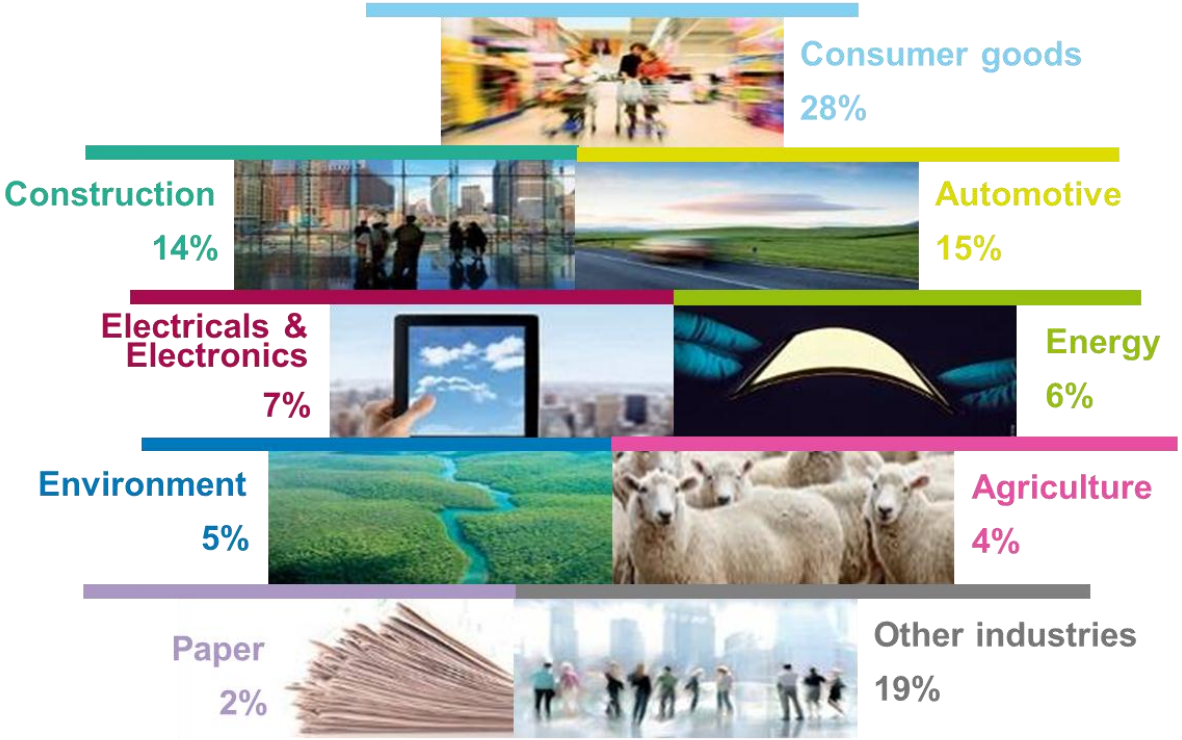
€2.1bn
Adjusted REBITDA

111
MAJOR INDUSTRIAL SITES

13
MAJOR R&I

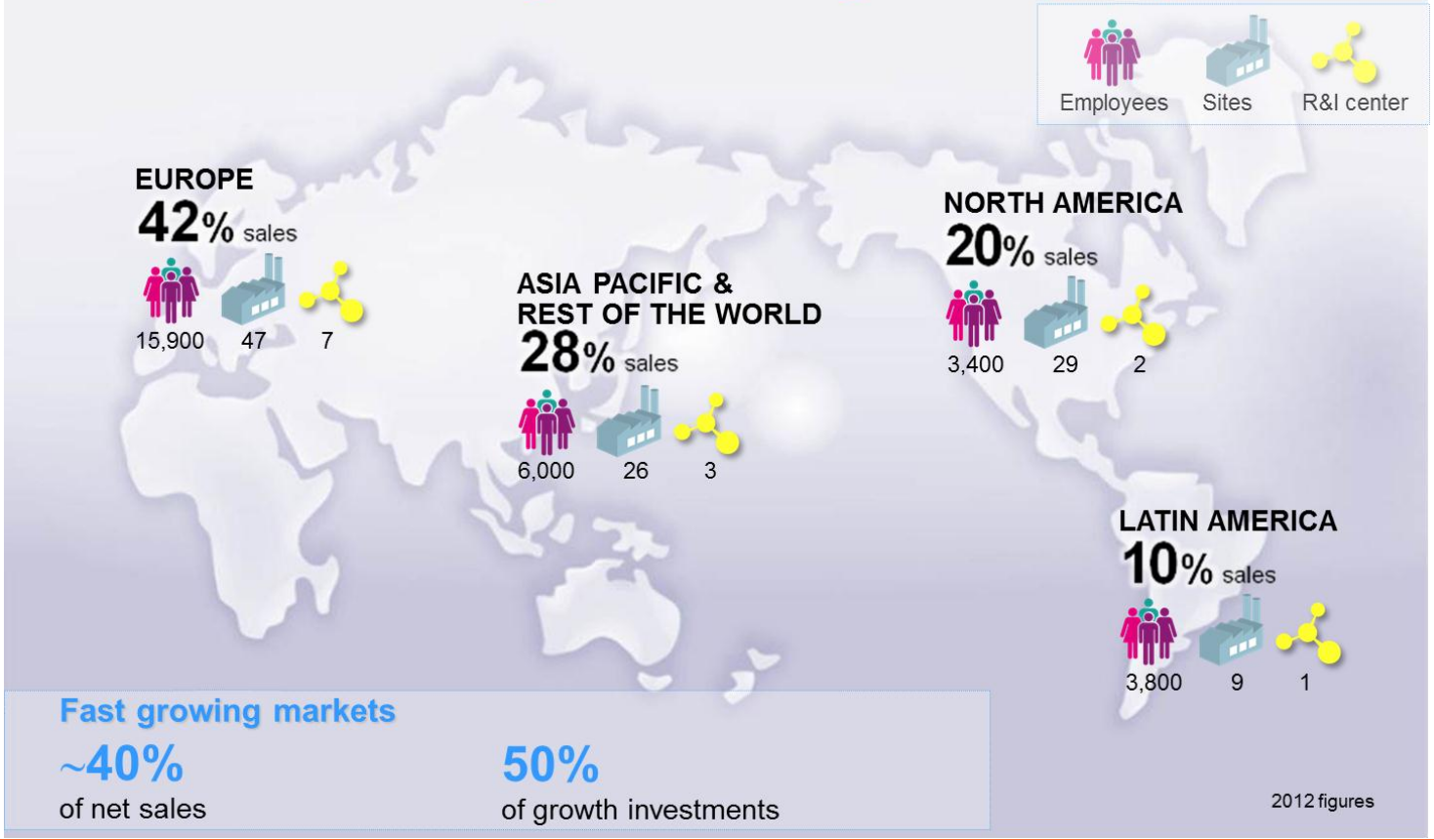
29,100
EMPLOYEES
55 COUNTRIES

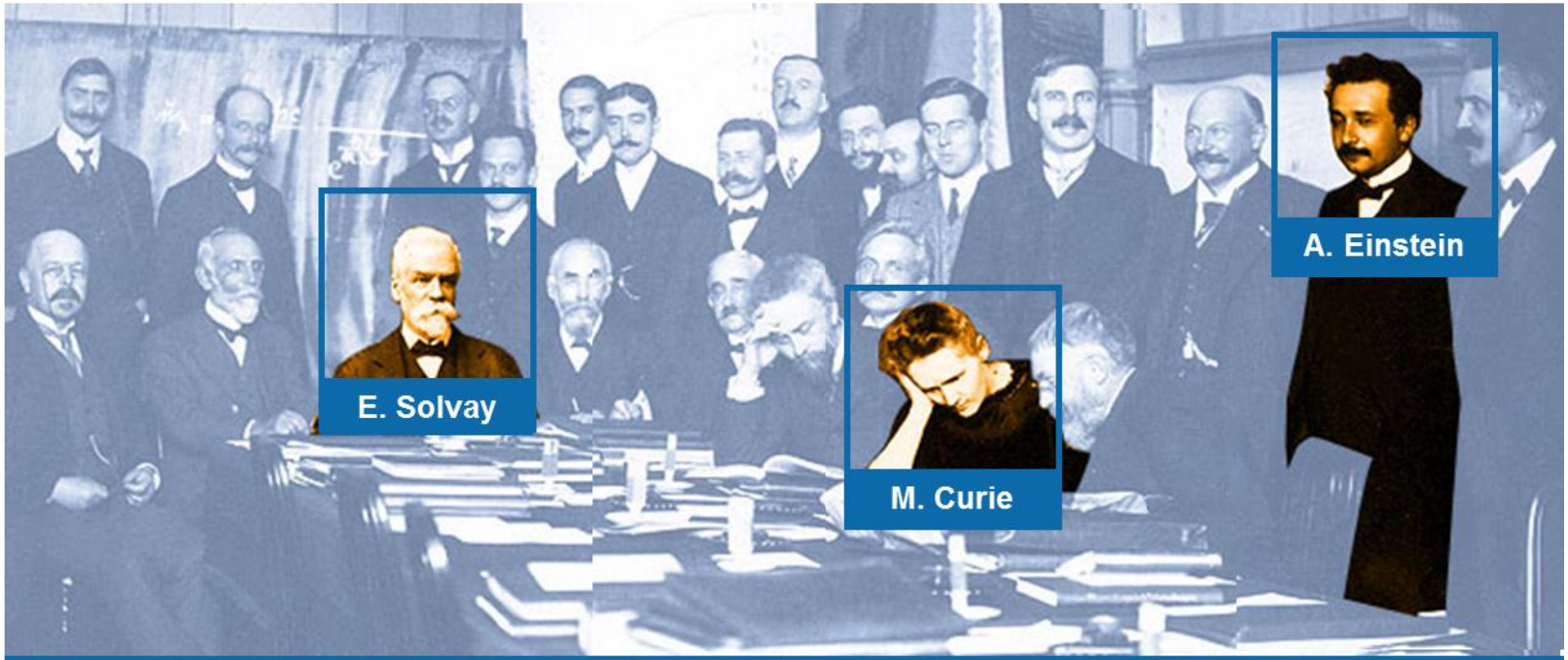
A well balanced portfolio of end markets



% of Group net sales (2012)

Historical strength in fast-growing regions





The first **Solvay Physics Conference in 1911**, included 8 Nobel prize winning chemists and physicists: Marie Curie, Albert Einstein, Onnes Kamerlingh, Hendrik Lorentz, Walther Nernst, Max Planck, Ernest Rutherford, Jean Perrin

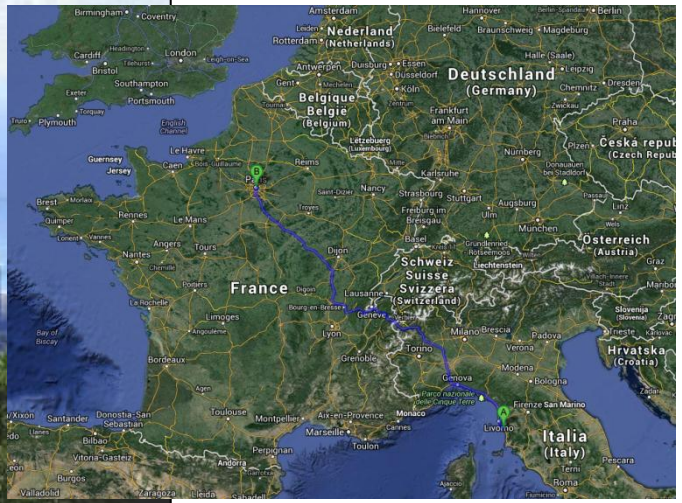
Rosignano factory

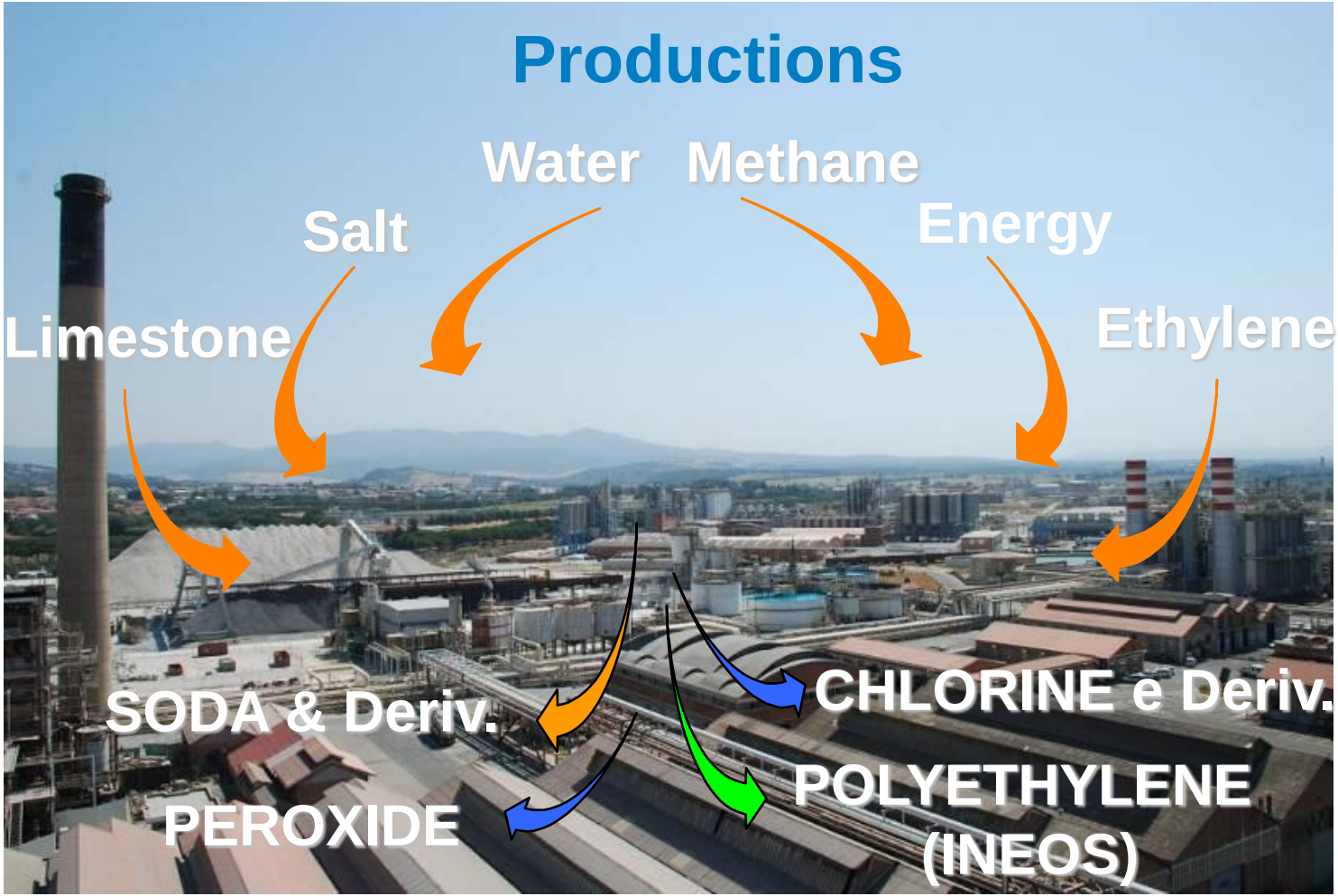
Historical notes

- Building start 1912
- Production start 1917

Current situation

- The factory occupies 2.2 km²
- Sales: 264 M€
- Investments and maintenance: 35 M€
- People: 628 directly employed
  380 indirectly " "



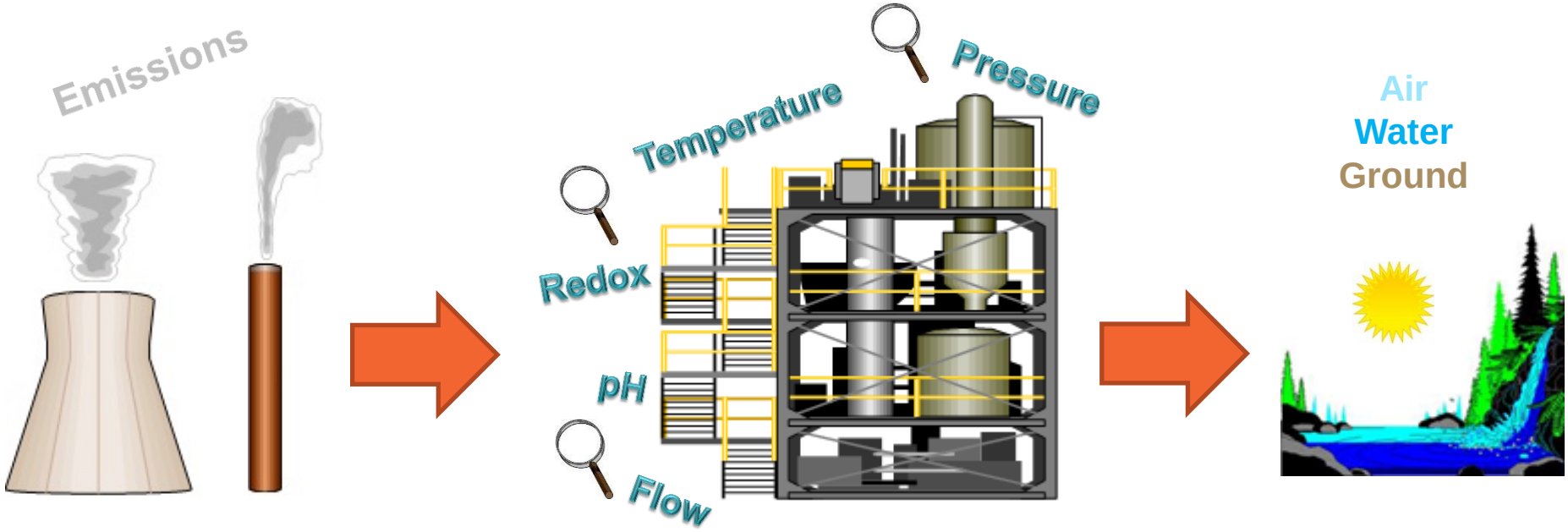


Production Capacity

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)



Competent Authorities

Process Engineers

Environment

PI System as an aid to control pollution

Help for IPCC

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

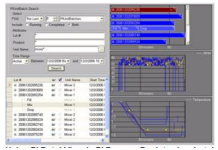
Help for Environmental Certification (ISO 14001)

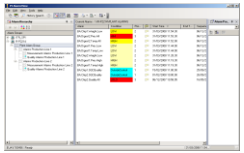
By registering all abnormal conditions you can analyze them and set a process of continuous improvement

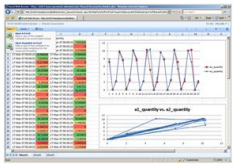
If you have an ISO 14001 certification you got a longest IPPC permit

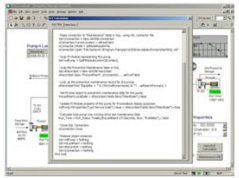
Our solution (legacy PI System)

PI Server — To archive Process, Calculated and Alarm Tags

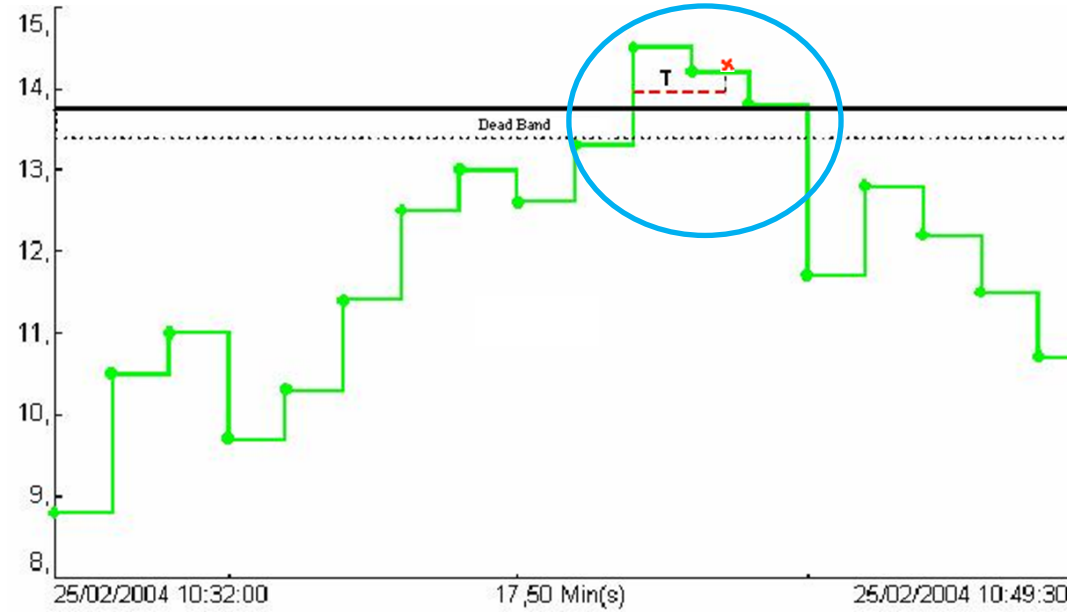
PI Batch  — To register Events

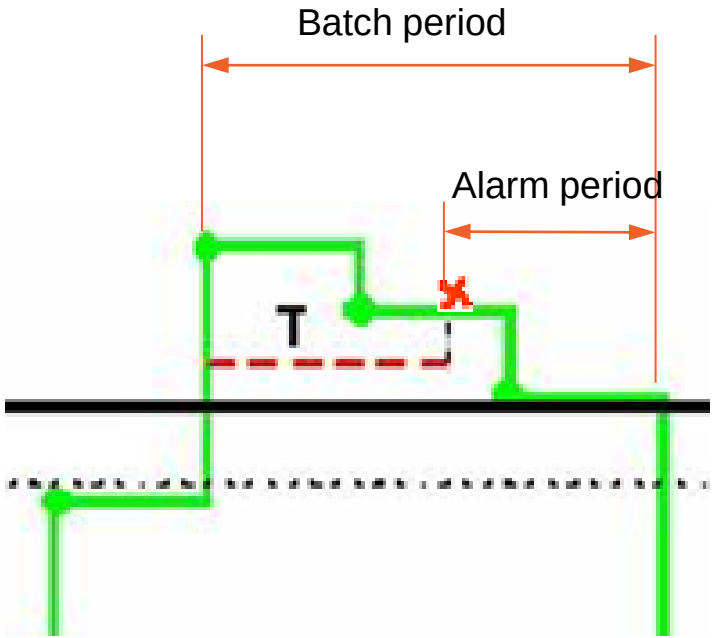
PI AlarmView  — To notify control room conductors

PI DataLink  — To report warning or alarm events

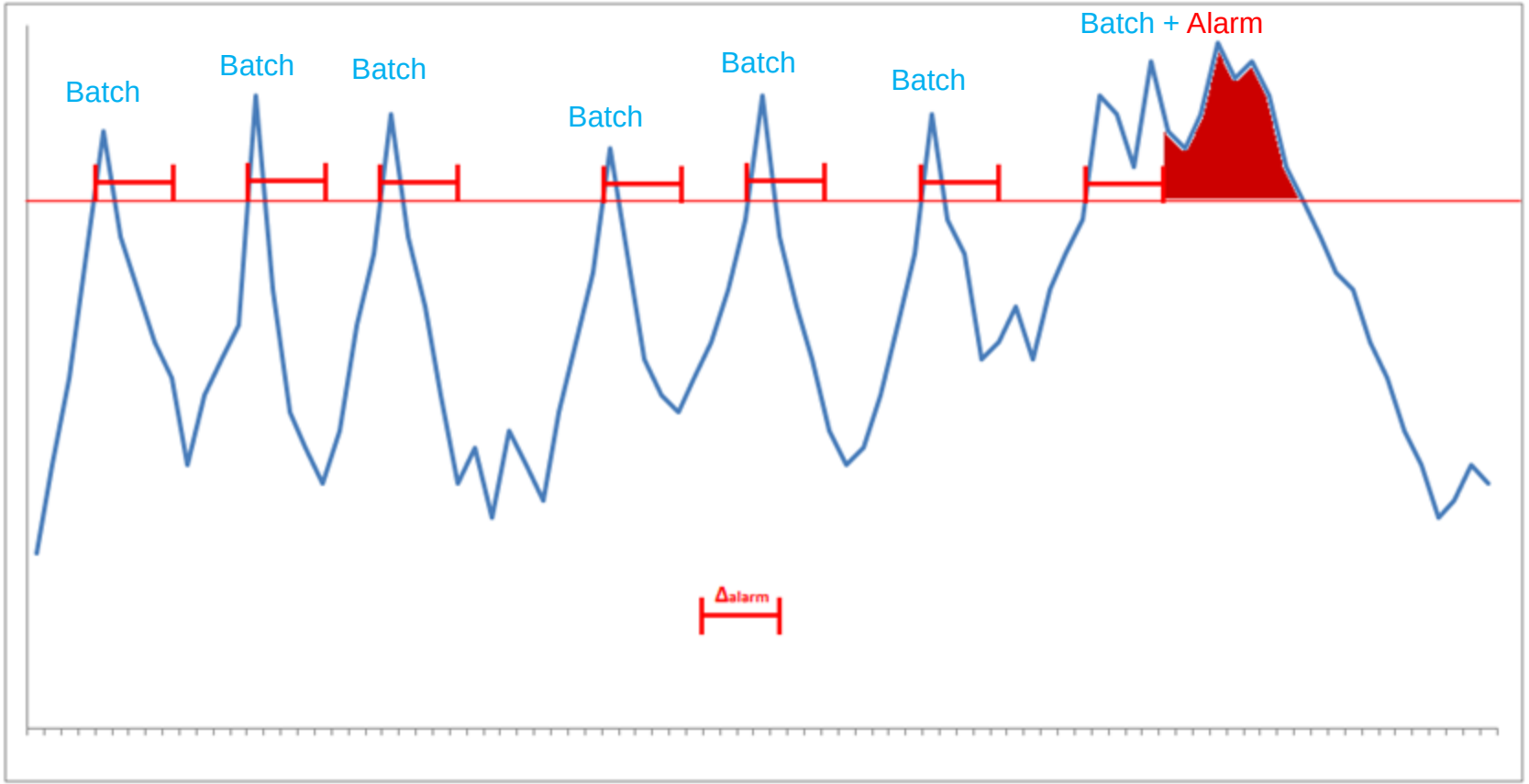
PI ACE  — To send Alarm Notifications via e-mail/sms/etc.

Batch and Alarm Periods

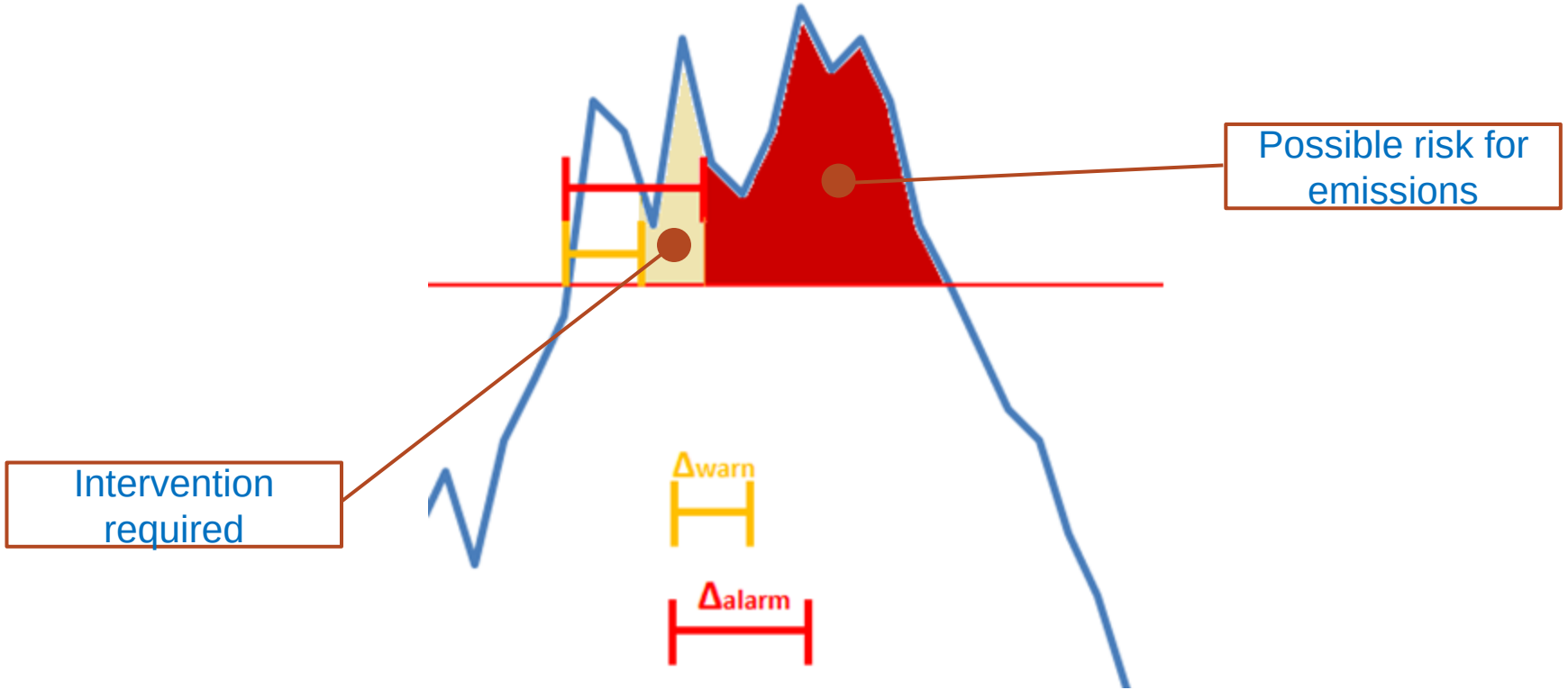




Batch and Alarm Periods

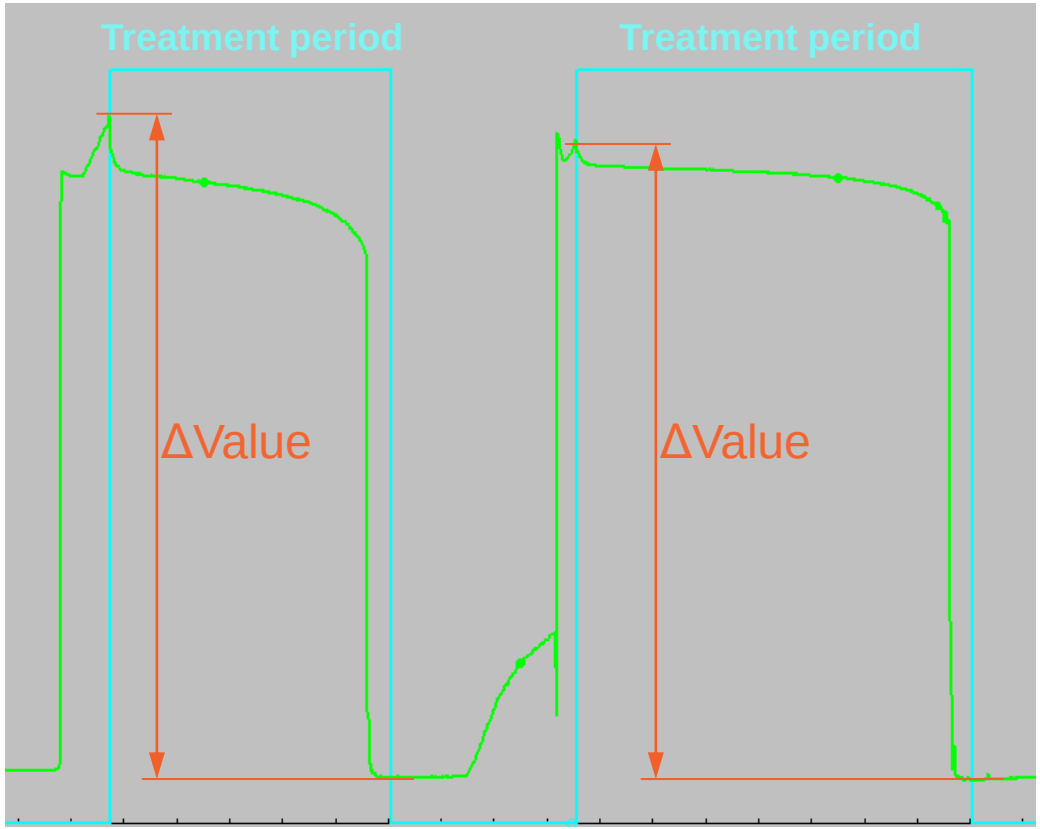


Alarm/Warning Periods



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

Treatment Efficiency

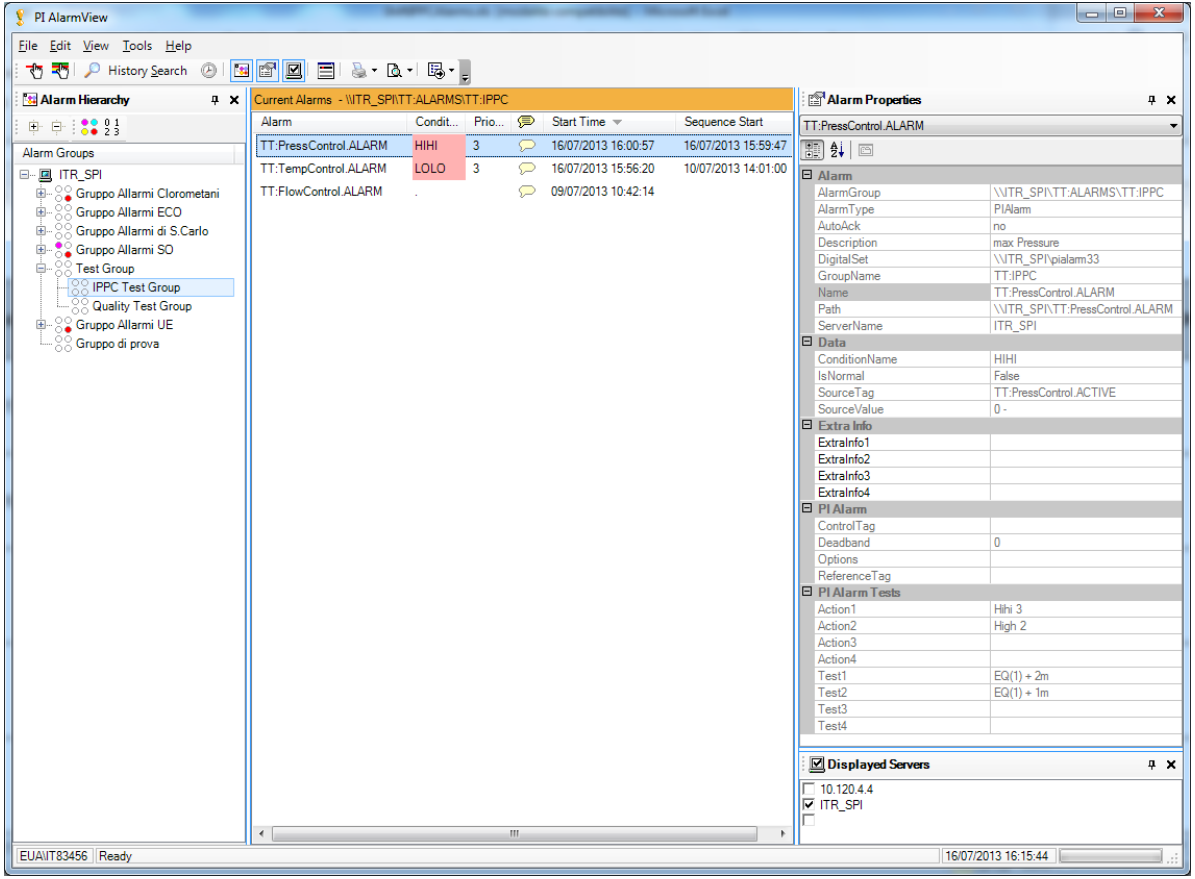


As an example, a Neutralization treatment is effective when a Delta Value is over a certain limit.

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 PI PE and PI Alarm Tags.

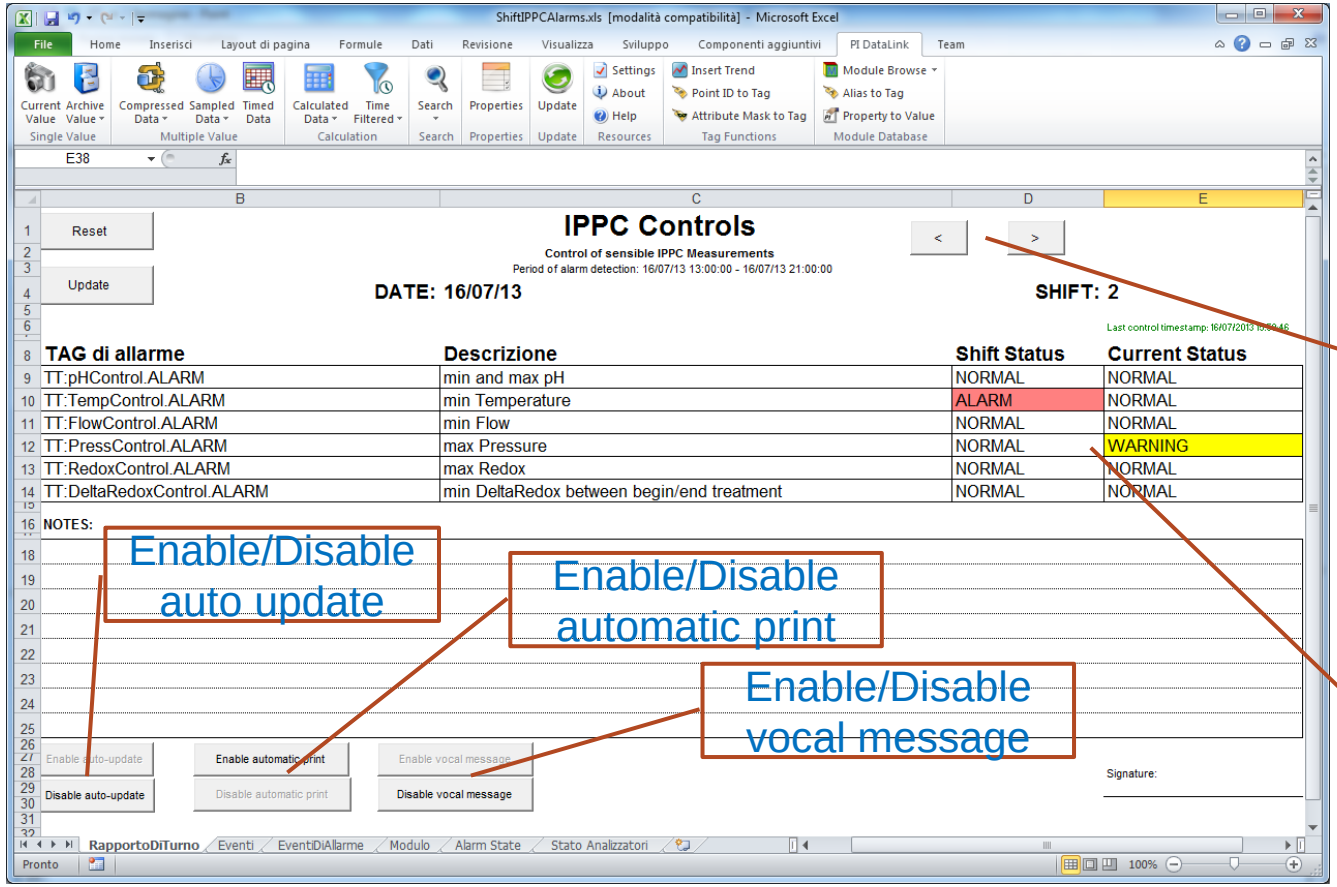
PI AlarmView



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

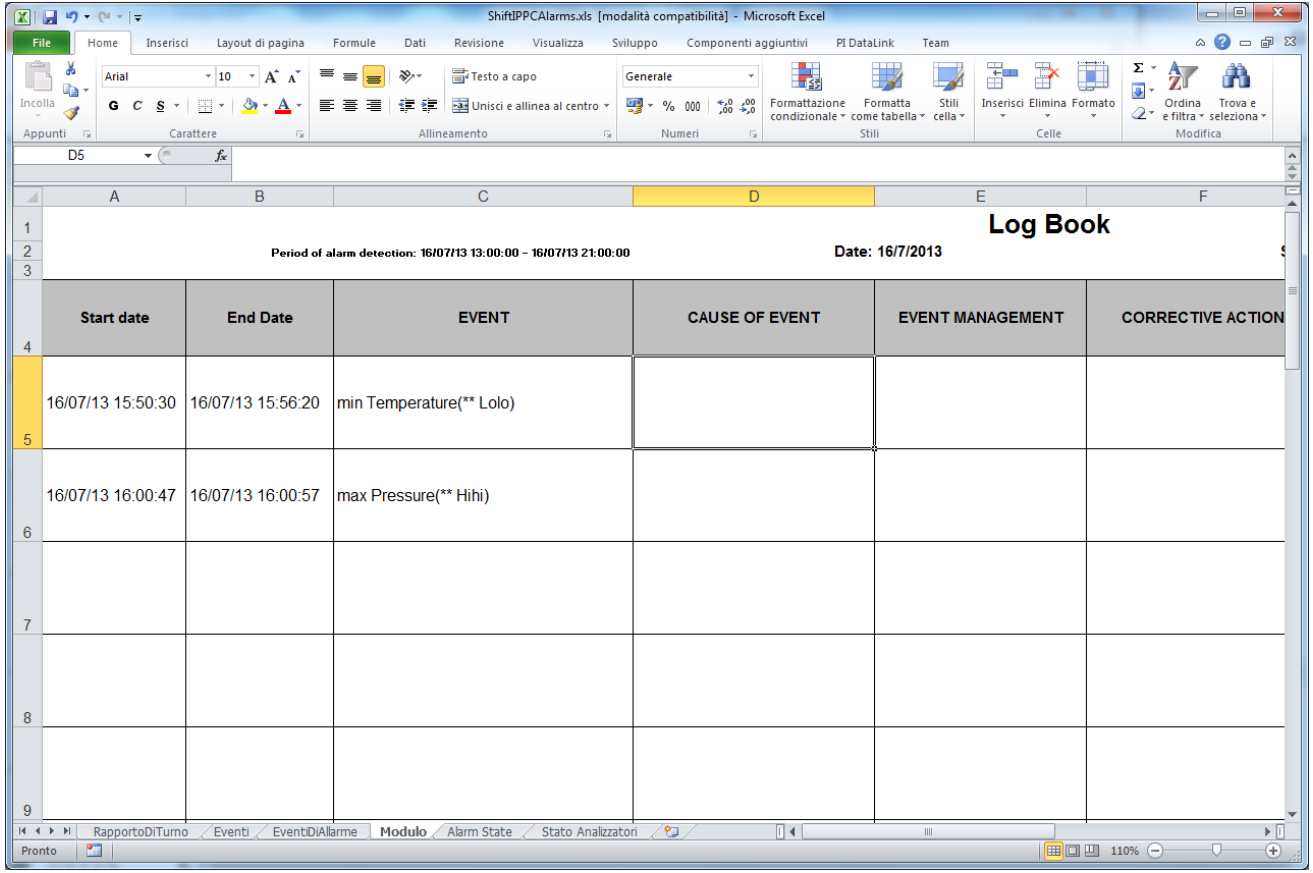
Enable/Disable auto update

Enable/Disable automatic print

Enable/Disable vocal message

Alarm Status currently and during the selected shift

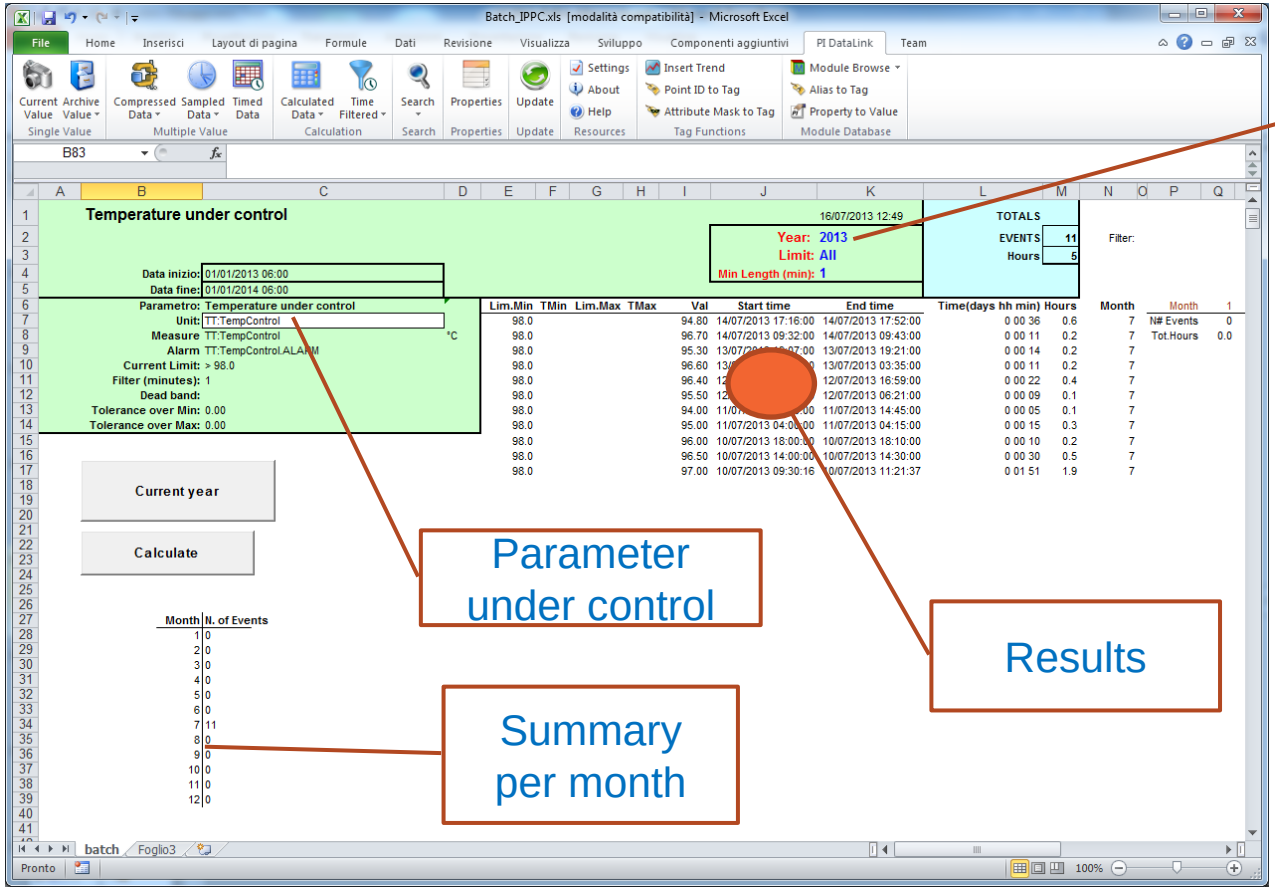
PI DataLink



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

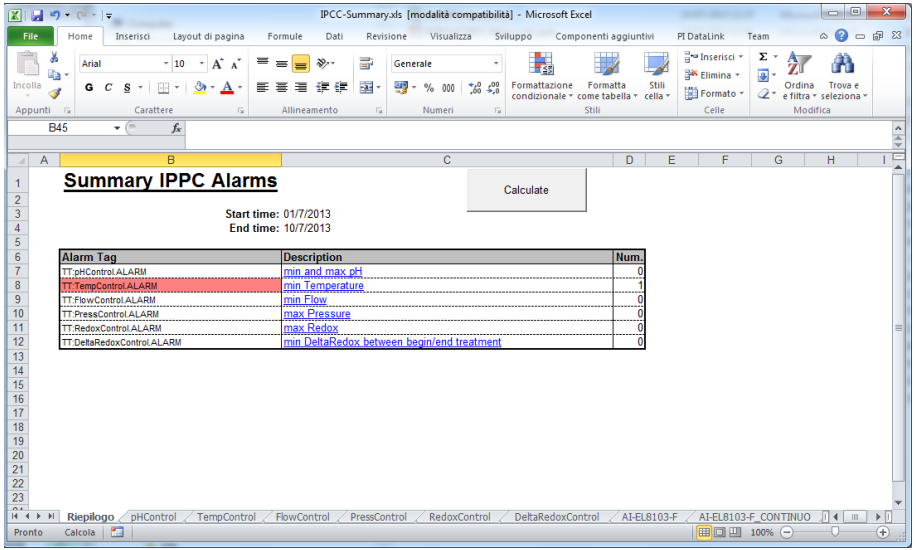


Filter on Year and Lenght of Time

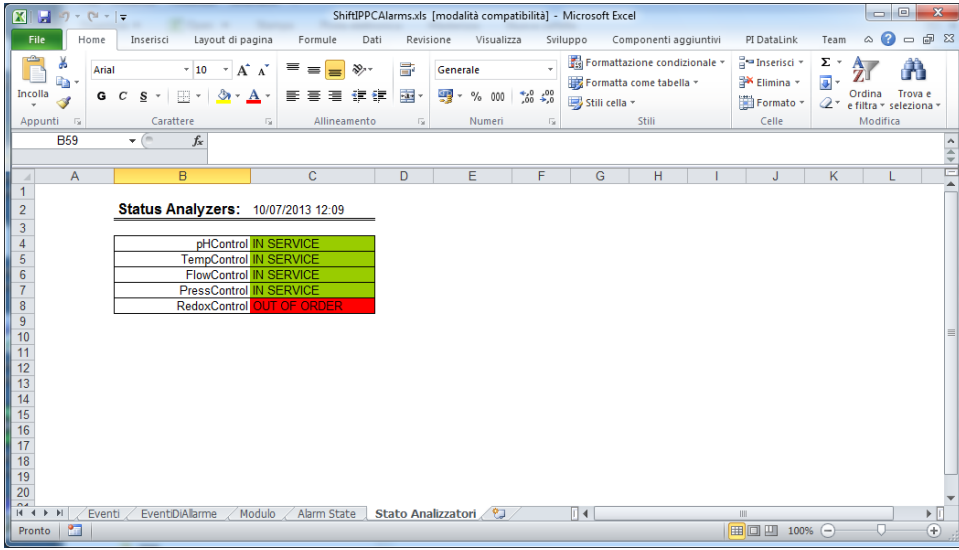
We use some reports to look at all events passing thresholds for any possible length of time.

PI DataLink

Some summary reports



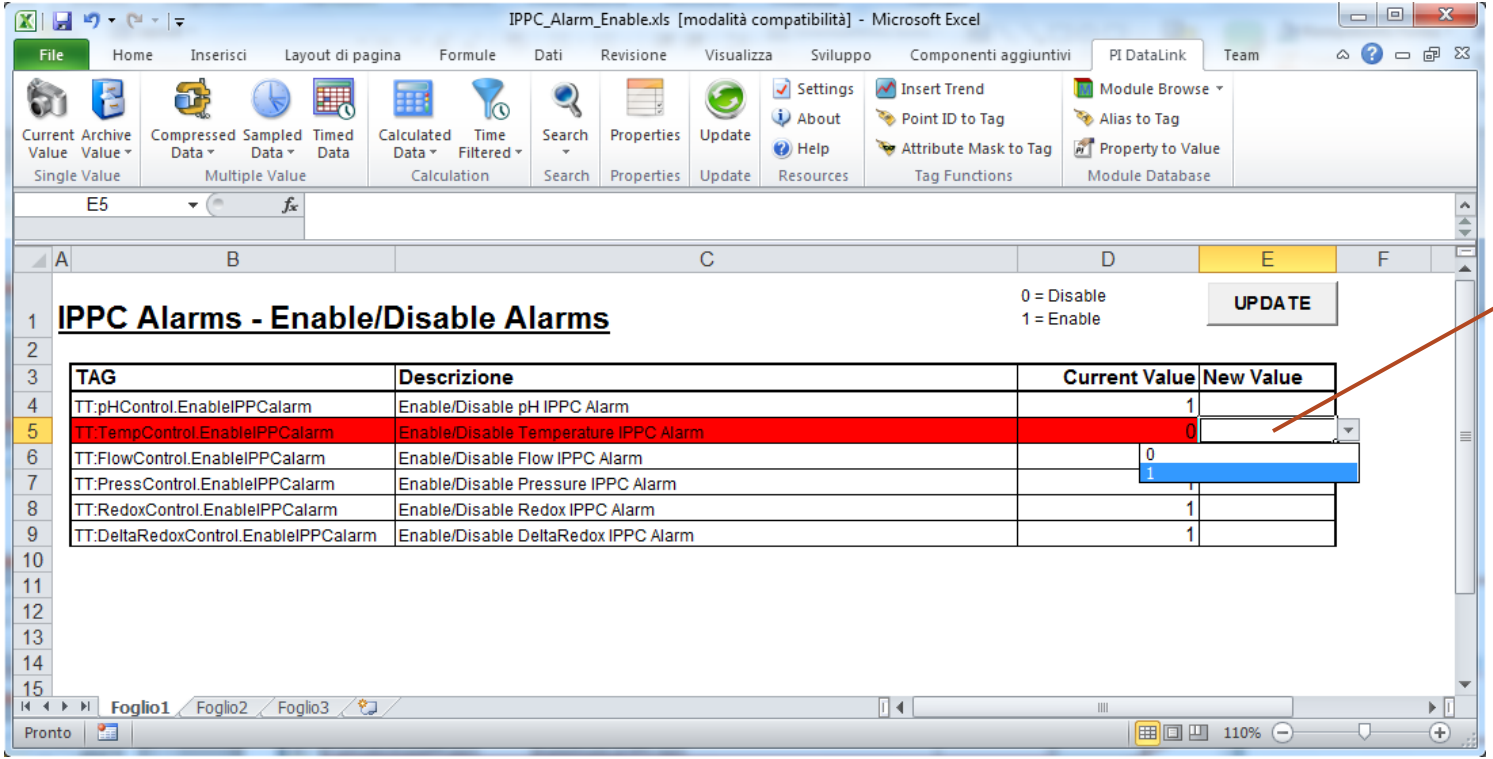
List of alarm occurrences for the selected month.



Alarm testing can be disabled depending on the analyzer status. Such status is set at DCS/PLC level.

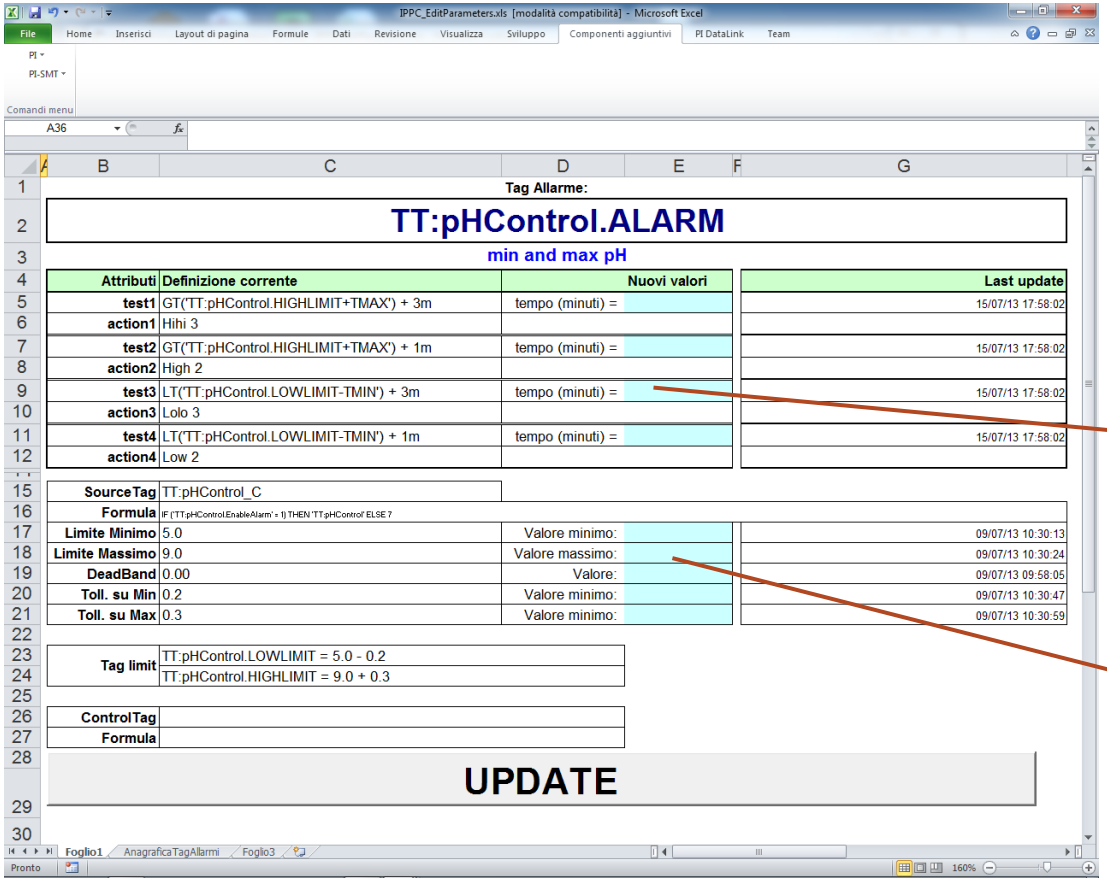
PI DataLink

Enable/Disable Alarm Test



Set
0 to disable
1 to enable

PI DataLink + PI SDK



IPPC_EditParameters.xls [modalità compatibilità] - Microsoft Excel

Tag Allarme:

TT:pHControl.ALARM

min and max pH

Attributi	Definizione corrente	Nuovi valori		Last update
test1	GT('TT:pHControl.HIGHLIMIT+TMAX') + 3m	tempo (minuti) =		15/07/13 17:58:02
action1	Hihi 3			
test2	GT('TT:pHControl.HIGHLIMIT+TMAX') + 1m	tempo (minuti) =		15/07/13 17:58:02
action2	High 2			
test3	LT('TT:pHControl.LOWLIMIT-TMIN') + 3m	tempo (minuti) =		15/07/13 17:58:02
action3	Lolo 3			
test4	LT('TT:pHControl.LOWLIMIT-TMIN') + 1m	tempo (minuti) =		15/07/13 17:58:02
action4	Low 2			
SourceTag	TT:pHControl_C			
Formula	IF ('TT:pHControl.EnableAlarm' = 1) THEN 'TT:pHControl' ELSE 7			
Limite Minimo	5.0	Valore minimo:		09/07/13 10:30:13
Limite Massimo	9.0	Valore massimo:		09/07/13 10:30:24
DeadBand	0.00	Valore:		09/07/13 09:58:05
Toll. su Min	0.2	Valore minimo:		09/07/13 10:30:47
Toll. su Max	0.3	Valore minimo:		09/07/13 10:30:59

Tag limit	
	TT:pHControl.LOWLIMIT = 5.0 - 0.2
	TT:pHControl.HIGHLIMIT = 9.0 + 0.3

ControlTag	
Formula	

UPDATE

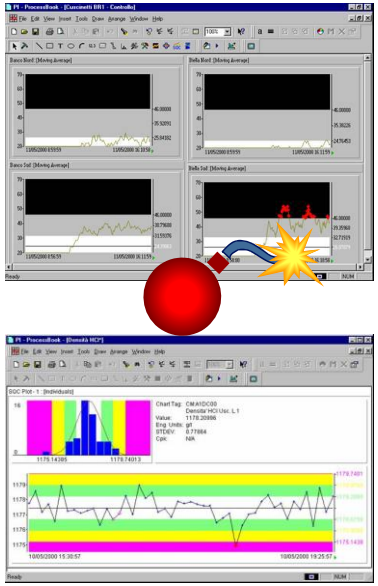
Foglio1 AnagraficaTagAllarmi Foglio3

Alarm configuration editing made by the end user.

Delays of the persistent conditions to generate warnings/alarms

Alarm Limits

Notification means



Alarm Detection

PI ACE

Send of e-mail with documents enclosed

Send of SMS

Messages on the Screen

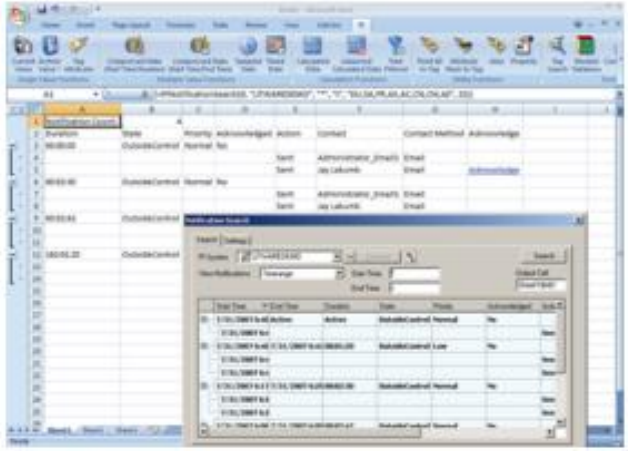
Setting Output Tags

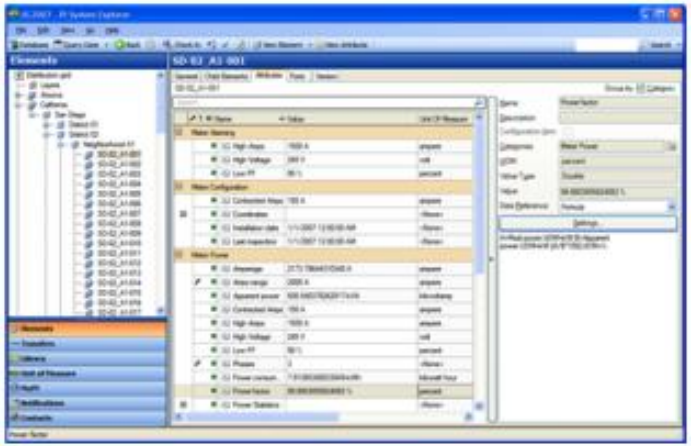
Turning on

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

Future

Exploring PI AF/PI Event Frames + PI Notifications…





Questions

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Solvay Chimica Italia S.p.A.

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