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USER CONFERENCE
2008
AMSTERDAM

Empowering Business in **Real Time.**

PI Infrastructure for the Enterprise.

**ROMPETROL'S REAL TIME
INFORMATION SYSTEM:
a road from PLANT OPERATIONS
FIELD DATA to MANAGERIAL
DECISIONS**

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Romp petrol



Agenda

- **The Rompetrol Group**
- **Rompetrol Refinery Information System and the OSIsoft products**
 - **OSIsoft products at Rompetrol Refinery**
 - **2004: PI implementation**
 - **PI data sources**
- **Why PI ?**
 - **PI DataLink – Reports**
 - **Management Report – Storage Space**
 - **Management Report – Production**
 - **HTML visualization**
 - **Rompetrol Refinery – PI Process Book**
 - **Crude unit**
 - **Crude oil – tanks**
 - **Operational KPI**
- **Sigmafine – Mass Balance –Model**
 - **Sigmafine –Data Inputs**
 - **Sigmafine –Data Outputs**
 - **Sigmafine –Products Transfers**
 - **Sigmafine – Mass Balance - Analysis**
 - **Sigmafine – Mass Balance – Graphic Model**
- **From Past to Future**
- **Conclusions**

Rompetrol

- A leader in the regional oil field
- A multinational company
- Activities in 13 countries
- Strong operational base in:
 - The Black Sea region
 - The Mediterranean Sea region



Rompetrol

- **Through its 40 subsidiaries, The Rompetrol Group is mainly active in the refining process with implications in complementary projects, exploration and production, distribution, industrial services, maintenance, project management, logistics, industrial ecology and other related services in France, Romania, Spain and South-Eastern Europe.**
- **Other non-core businesses: air transportation, tourism, safety and protection services.**

Rompetrol Petromidia Refinery

- Designed and built between 1975-1977
- Romanian and foreign technology
- Rompetrol Refinery can process a wide variety of crude.
- Refinery capacity = 5.300.000 tones/year.
- High quality control and information systems:
 - DCS
 - Information System = OSIsoft Plant Information

2004: PI implementation

- From DCS – data available only for the operators
- A lot of Manual Data Collecting Process
- No real time information about the processes, equipments
- No on time reports
- Delay between the figures and facts

Past- 2004

PI System was a novelty
for Petromidia Refinery

2004- now

PI users:
Technical & Non-technical staff

Managed and eliminated

Rompotol Petromidia Refinery
2004 : PI implementation

Now-2010

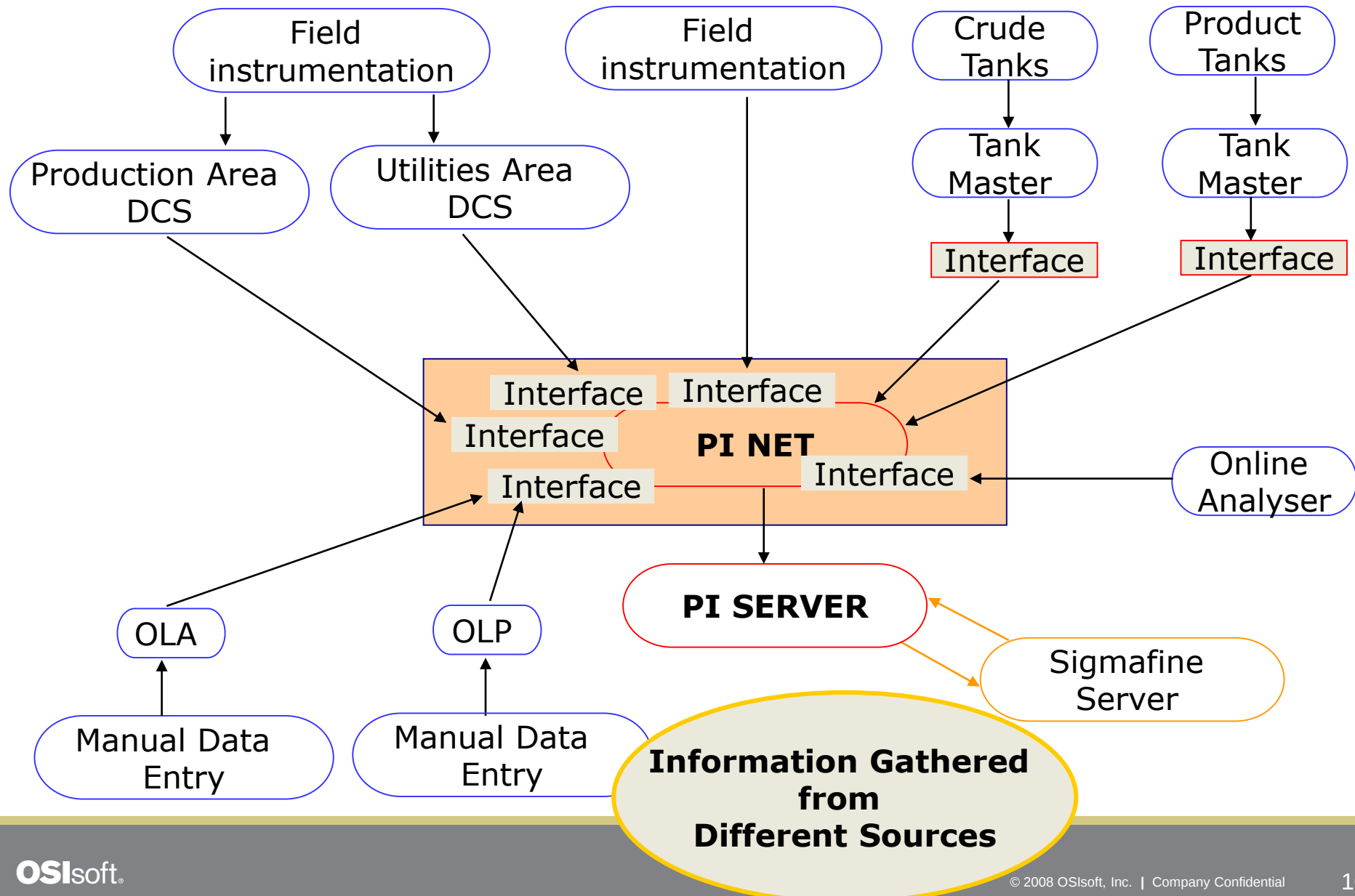
Plant Information – future:

- ❖ Vega Refinery
- ❖ Petrochemical Plant

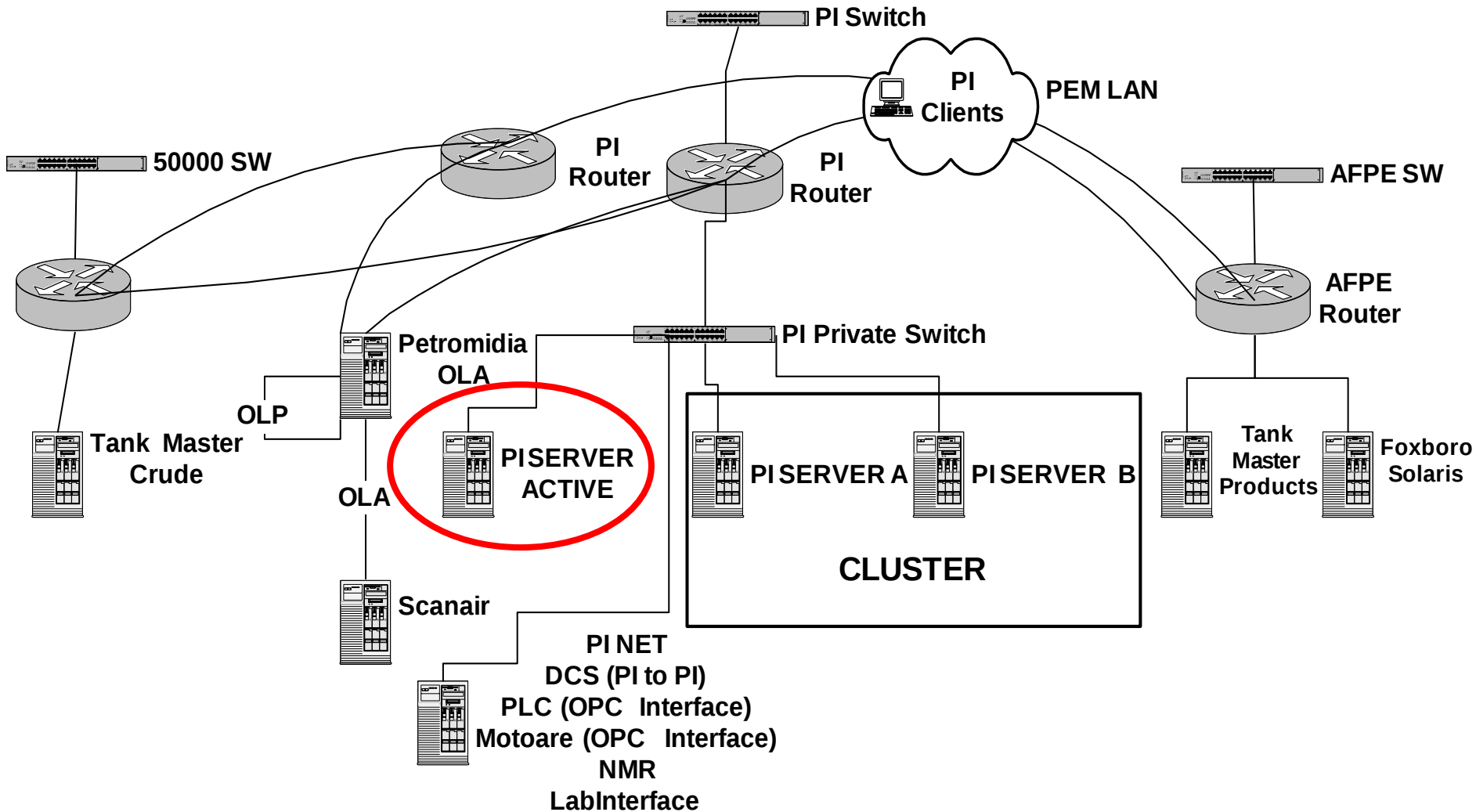
OSIsoft products at Rompetrol Refinery

- **PI Enterprise Server (3.4.375.38) : 30000 tags**
- **PI Client Application:**
 - **ComboPack Individual (PI ProcessBook&PI Data Link) - 90 users**
- **Sigmapine Server: AF 1.3. & SF v4.4.0.123**
- **Sigmapine Client:**
 - **PI AF Explorer: 1.3.0.1434**
 - **AF Modeler Add-in: 1.1.1.1323a**
- **SRP**

Data sources and interfaces



Overview: System Architecture



Why PI ?

- ❖ **ONE DATA BASE** for reports
- ❖ **REAL TIME** updates

Excel Reports before PI DataLink

- A huge number of reports delivered by e-mail
- Various data sources
- Inconsistencies between figures
- Large volume of calculations

Excel Reports – with PI Data Link

- Performance computing module
- One database for data process
- The information is updated in real time
- Formulas predefined

An overview of the entire refinery process data in real time:

Production Parameters:

- Temperature
- Pressure
- Flows
- Level

Equipment Health and Period of On-line Operation

PI DataLink



Without PI DataLink:

- Only general view of the process parameters
- Limited number of values for the parameters
- No real time reporting, only reports by shifts and by day



01-Aug-08 09:29:36	135.8695221
01-Aug-08 09:29:37	152.0245514
01-Aug-08 09:29:46	159.1876373
01-Aug-08 09:29:47	132.4098969
01-Aug-08 09:29:50	121.8366547
01-Aug-08 09:30:08	110.6049042
01-Aug-08 09:30:12	111.4638214
01-Aug-08 09:30:20	117.6300812
01-Aug-08 09:30:24	104.4804459
01-Aug-08 09:30:29	117.6047363

Many values
for each
parameter

PI DataLink

Generate reports at any moment of the day

Detailed overview of
refinery processes

REAL TIME

Excel DataLink – Reports

- **Management Reports :**
- **Stocks and storage space available :**
 - for the raw materials
 - main products
- **Production (values from PI) versus scheduled productions versus MOP.**
- **Operational Reports :**
- **Stocks reports -detailed information:**
 - Materials and grades
 - Storage Capacity
 - Material Properties: Density etc.
 - Level
 - Water level
 - Temperature
- **Production reports- by shift**

❖ Trends
❖ Reports
❖ Graphics

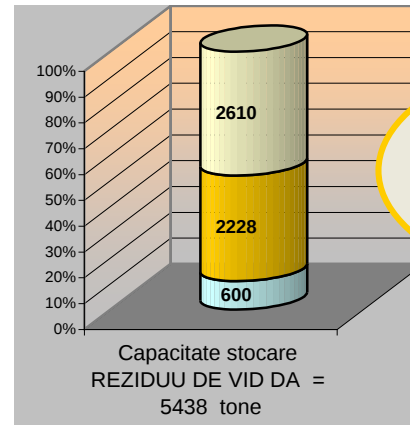
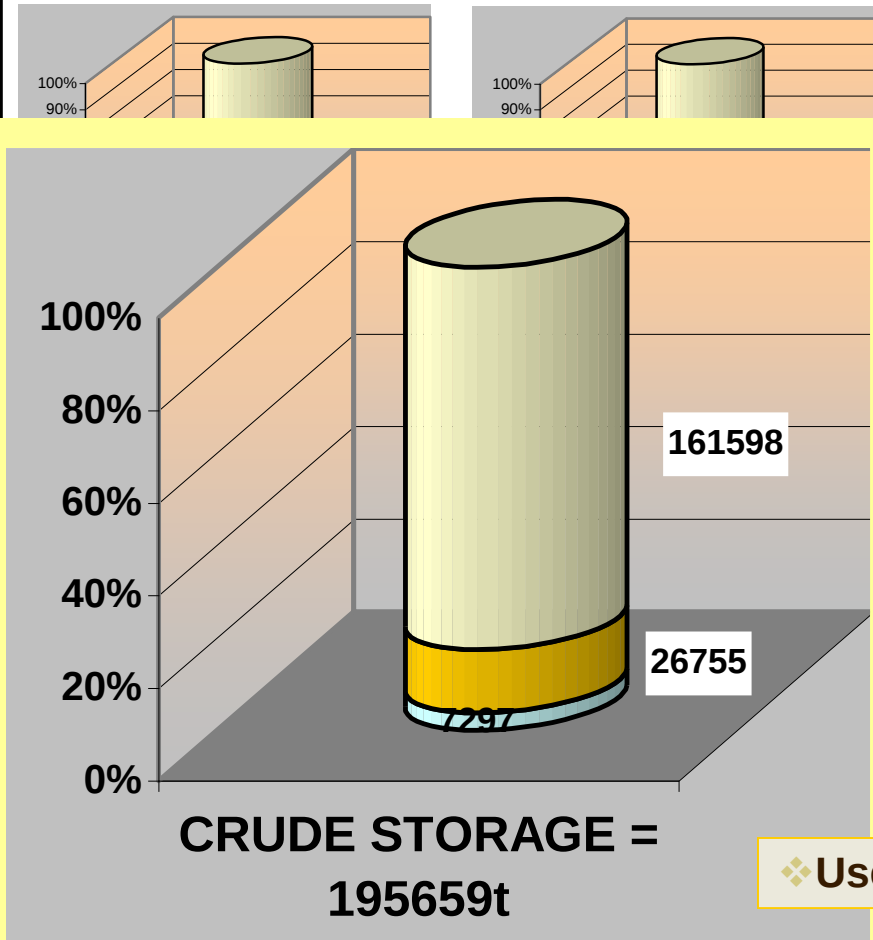
Management Report – Storage Space

Stocuri&Capacitati de stocare

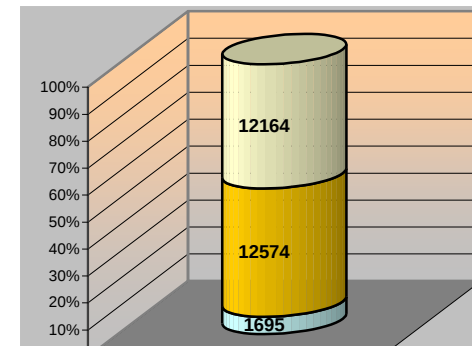
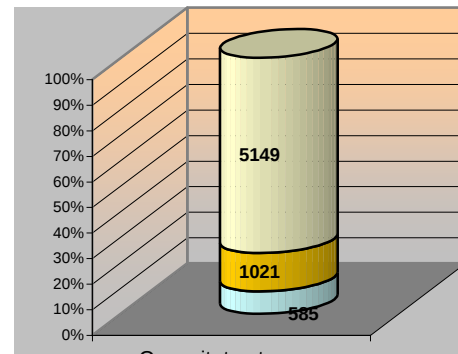
10/14/08 1:00 PM

Materii Prime

Reziduu

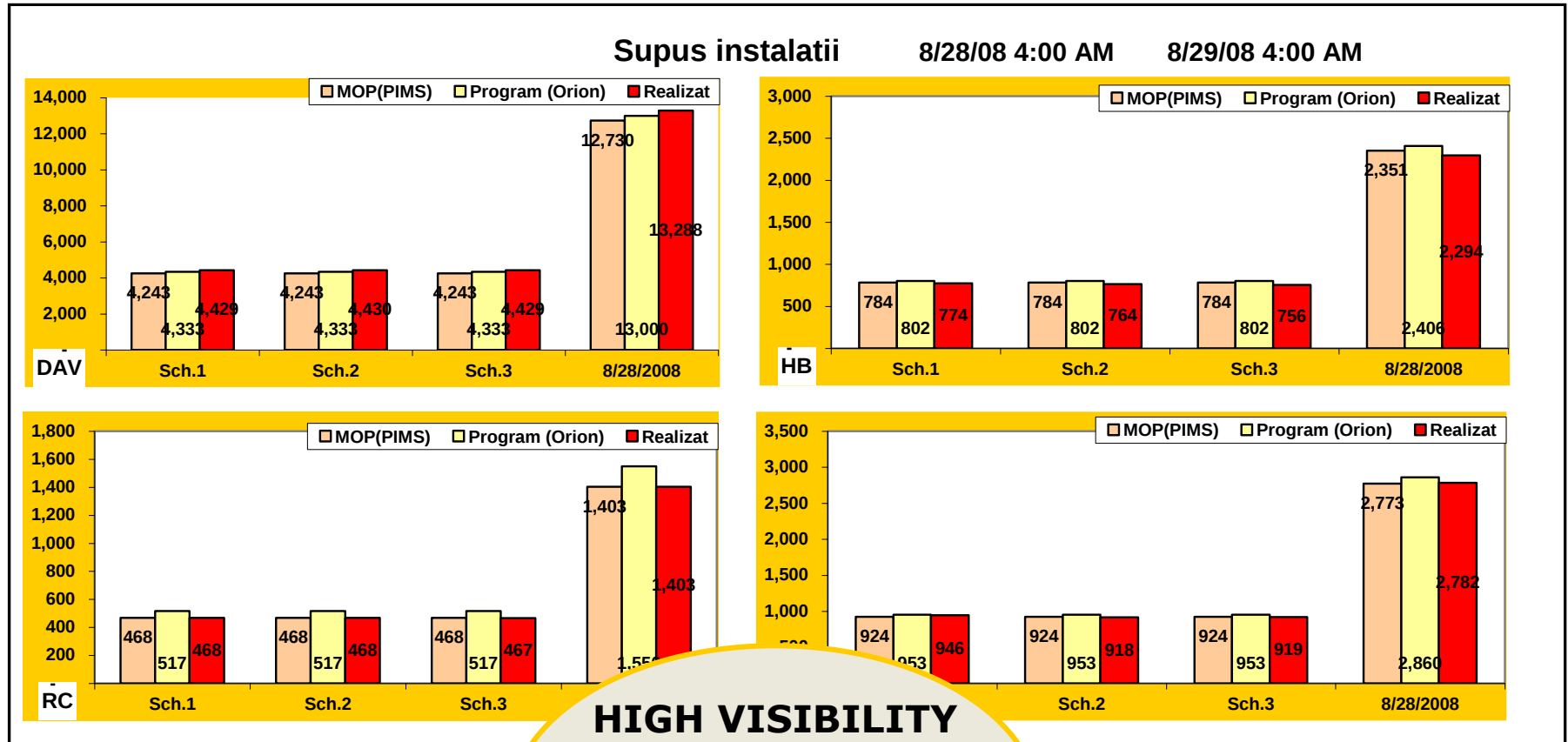


**VISUALIZATIONS
Based on
PI DATA**



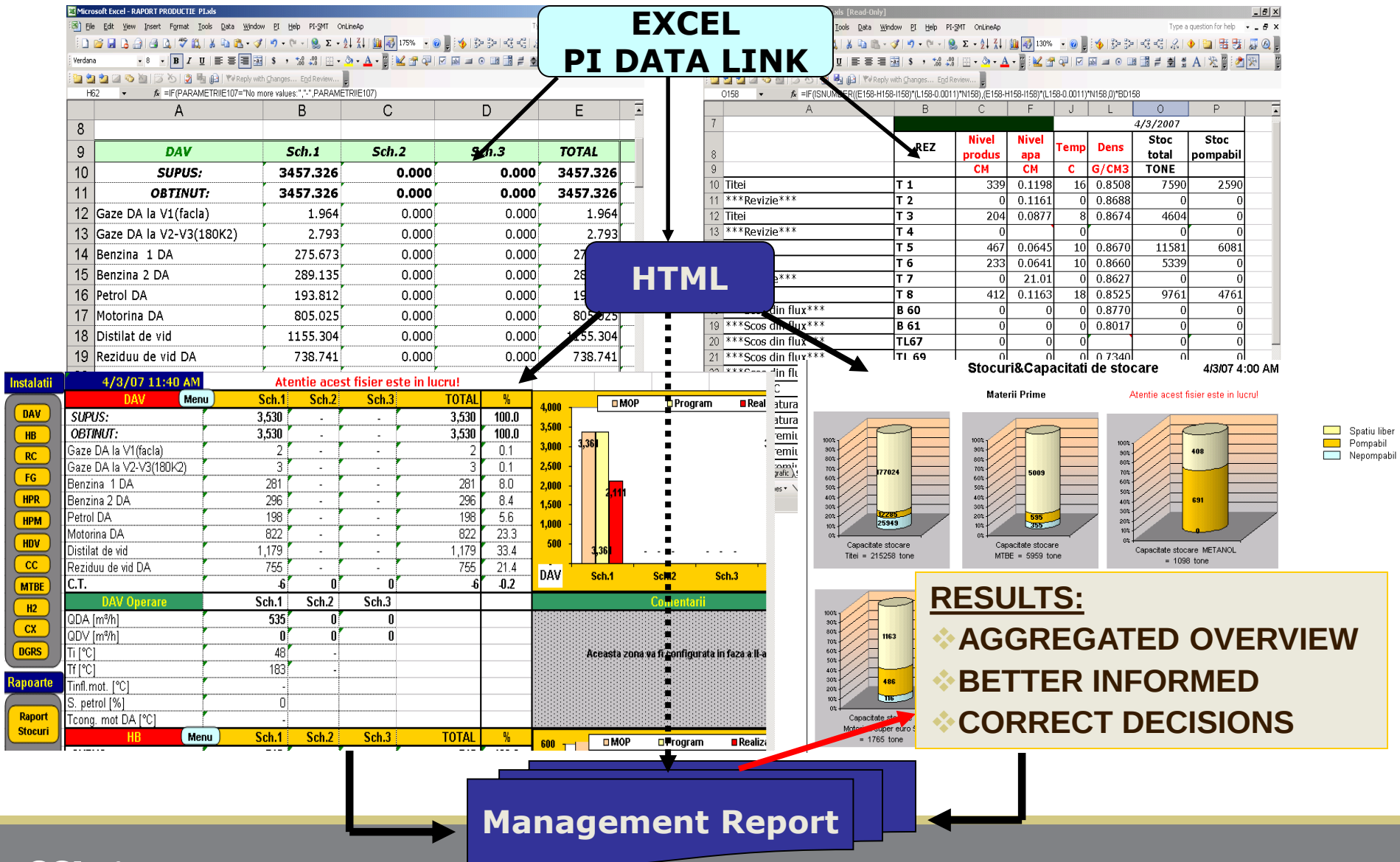
❖ Users can select the type of data they want to see

Management Report – Production



**HIGH VISIBILITY
of
ACTUAL PRODUCTION
VS
PLAN&SCHEDULES**

From EXCEL to HTML



HTML visualization



Engineers Report



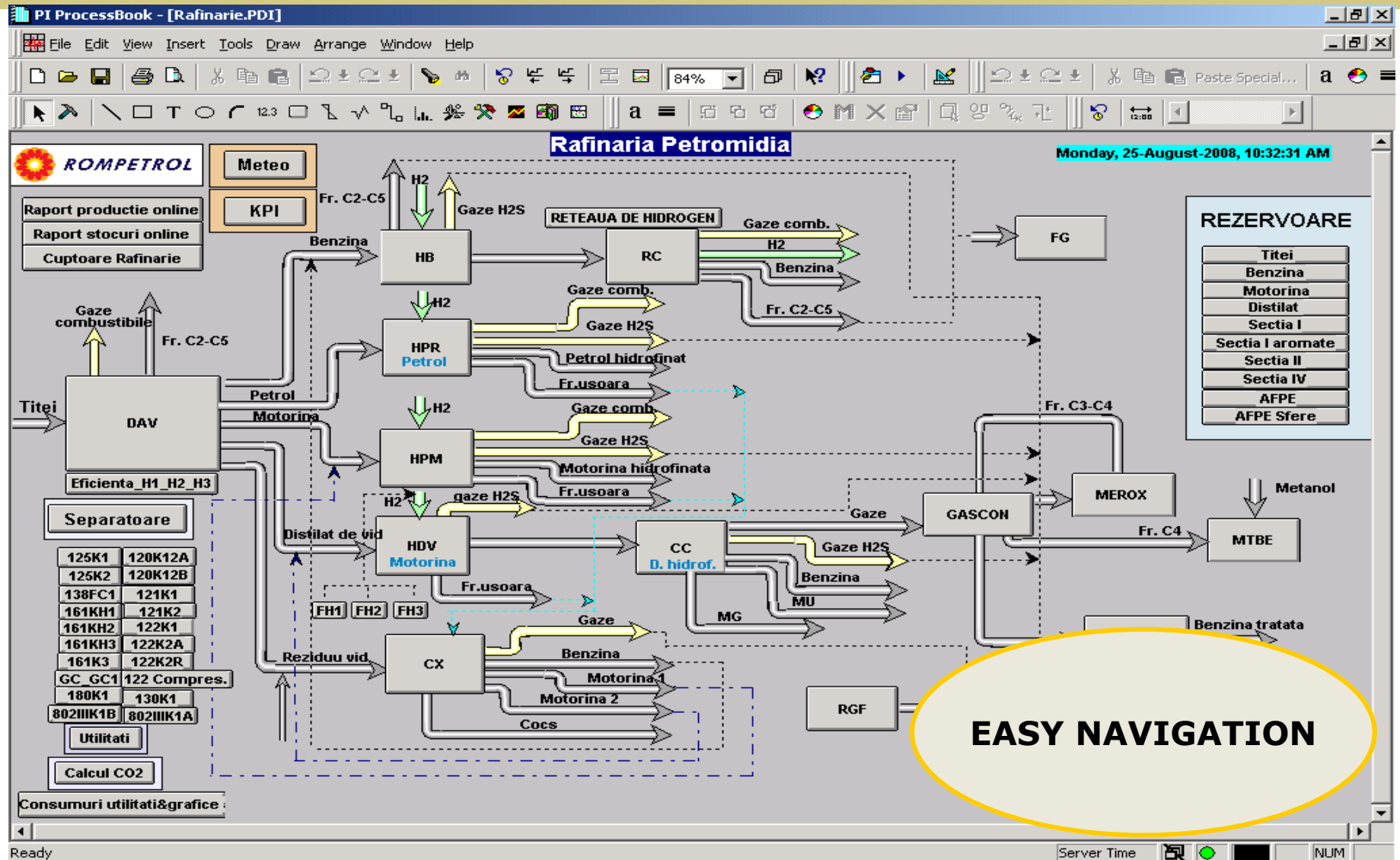
Management Report

- High speed for report upload
- Graphic visualization
- Multiple possibilities for accessing data :
 - INTRANET (done)
 - INTERNET (in progress)
 - SMART PHONE (in progress)
- Increasing the visibility of the information through the company systems
- Getting the required INFORMATION for the analysis on TIME
- SUPPORT for INFORMED DECISIONS

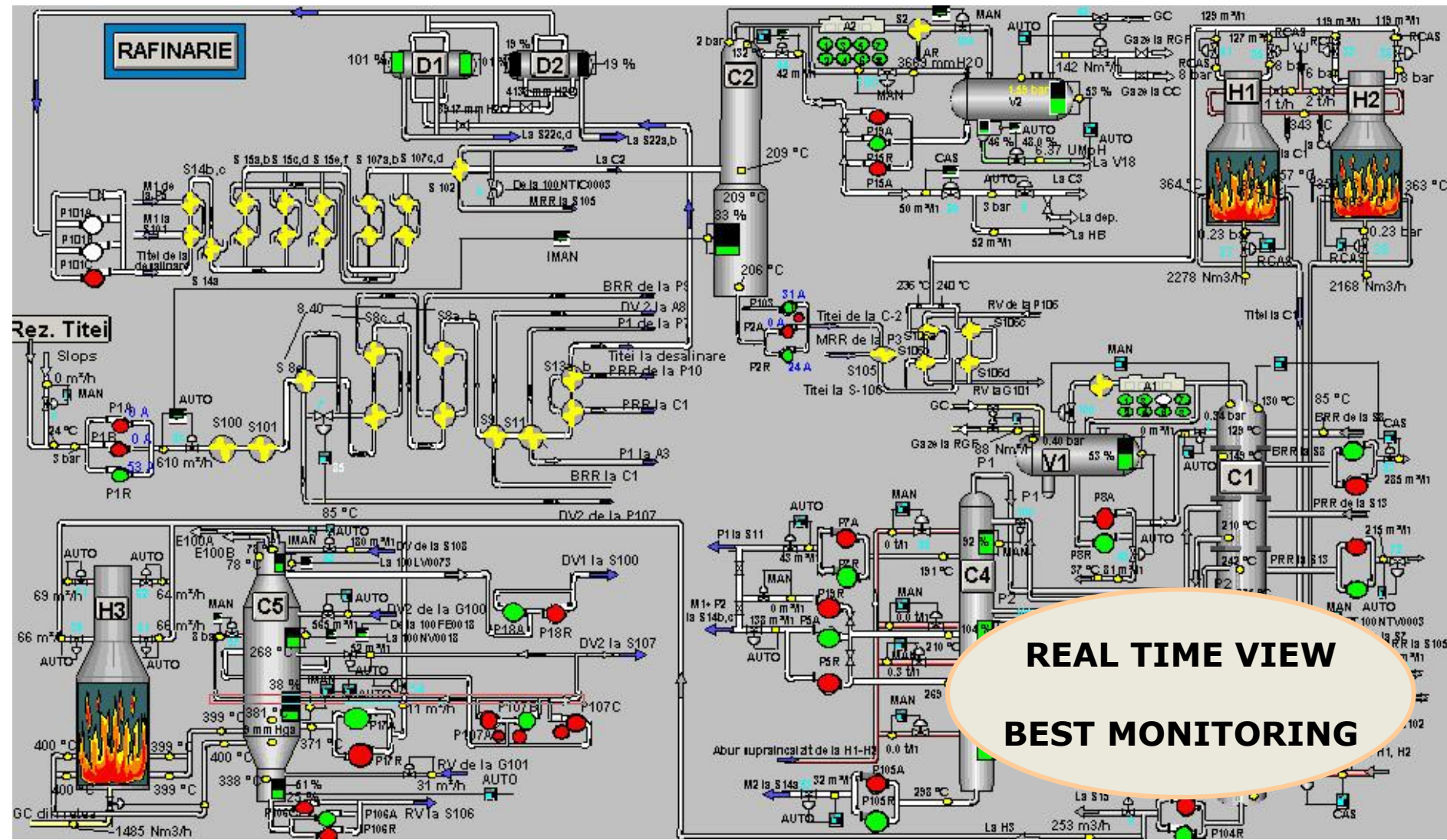


**Valuable information
In Real Time
To Any Place**

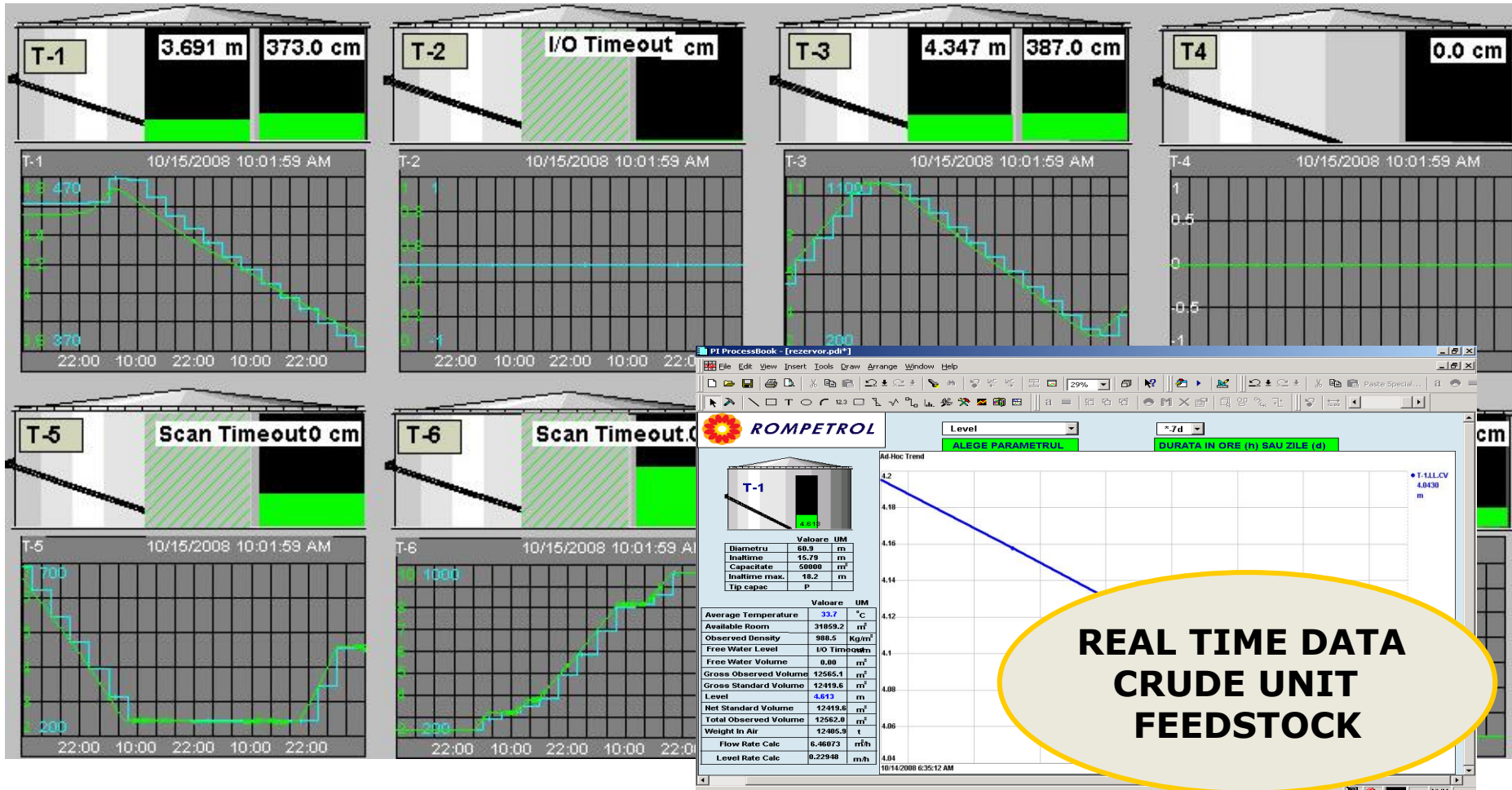
Rompetrol Refinery – PI ProcessBook



Crude unit

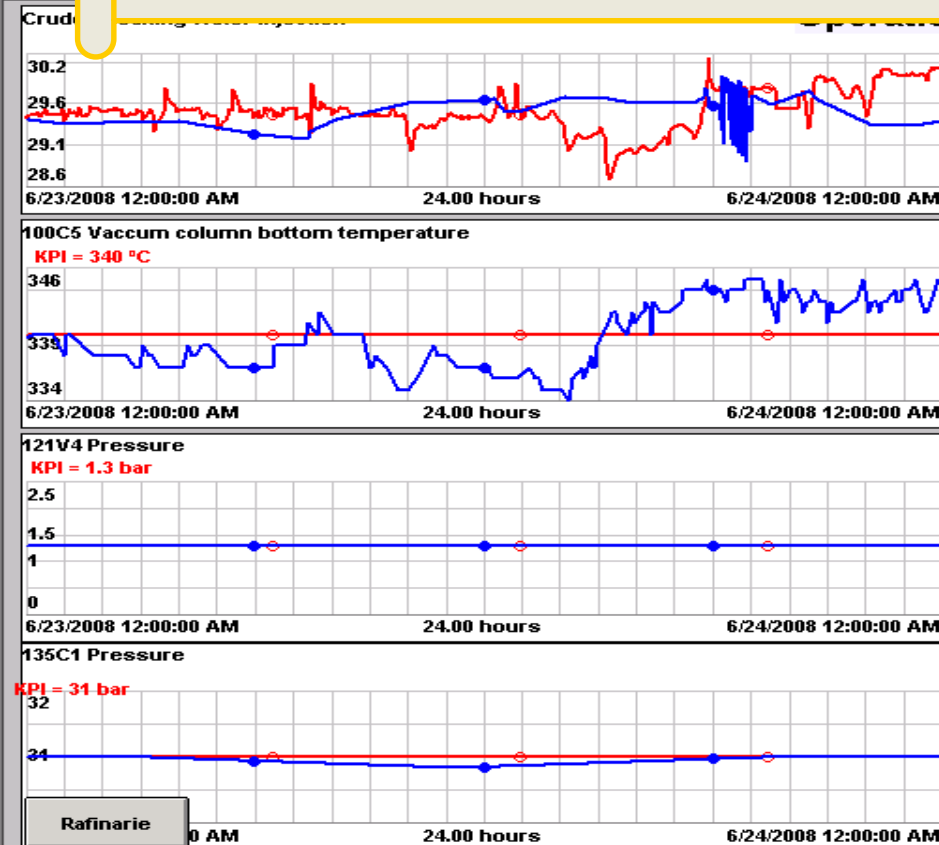


Crude oil – tanks

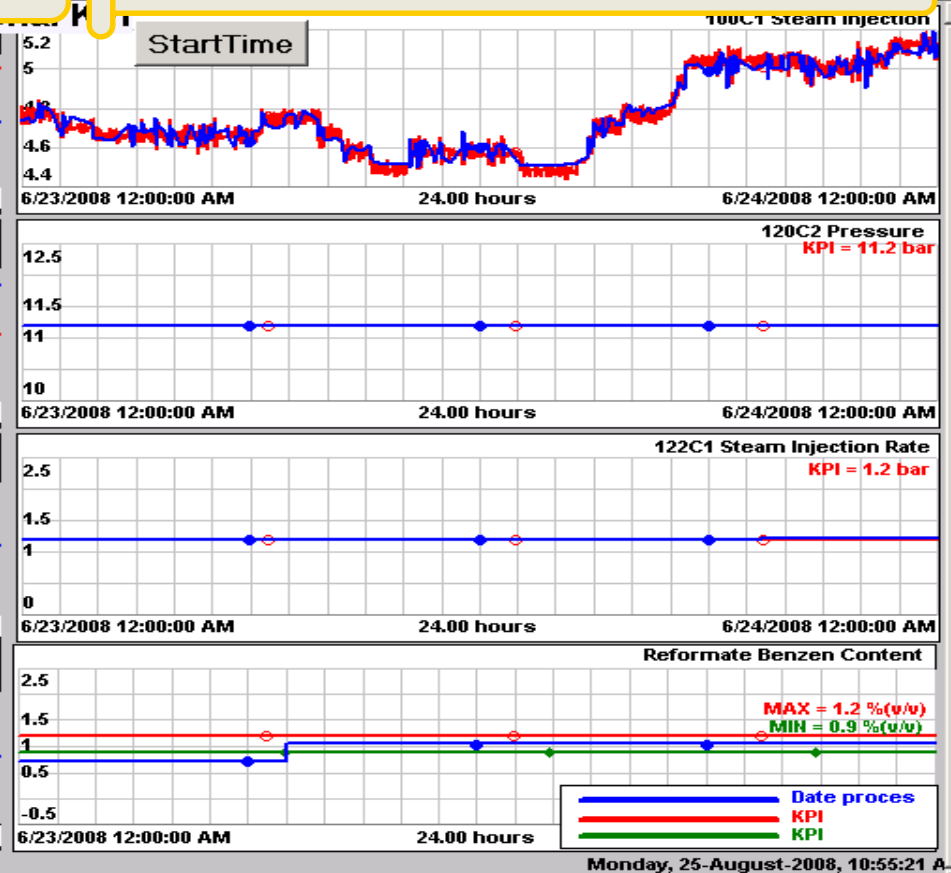


OPERATIONAL KPI

REPRESENTATIVE INFORMATION FOR MANAGEMENT

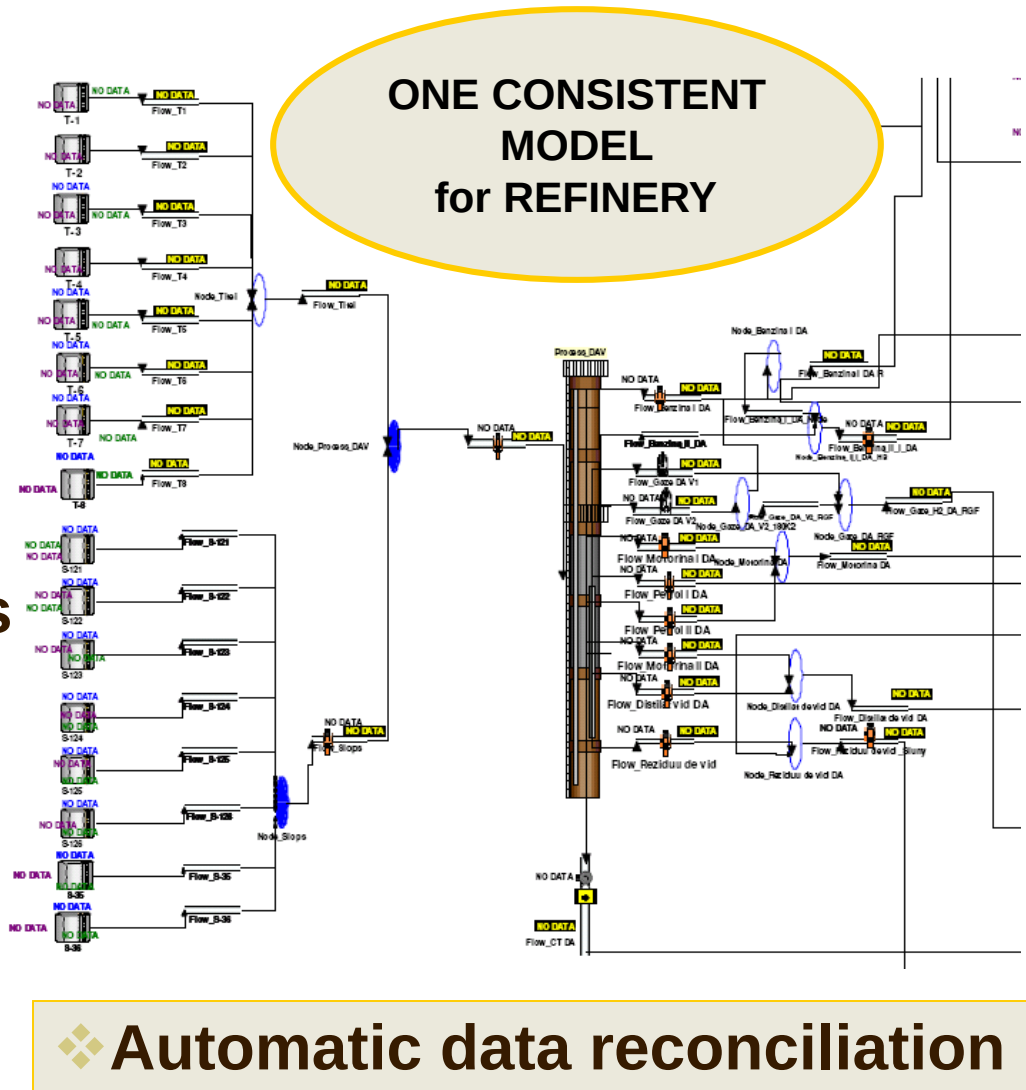


PROCESS DATA vs TARGET

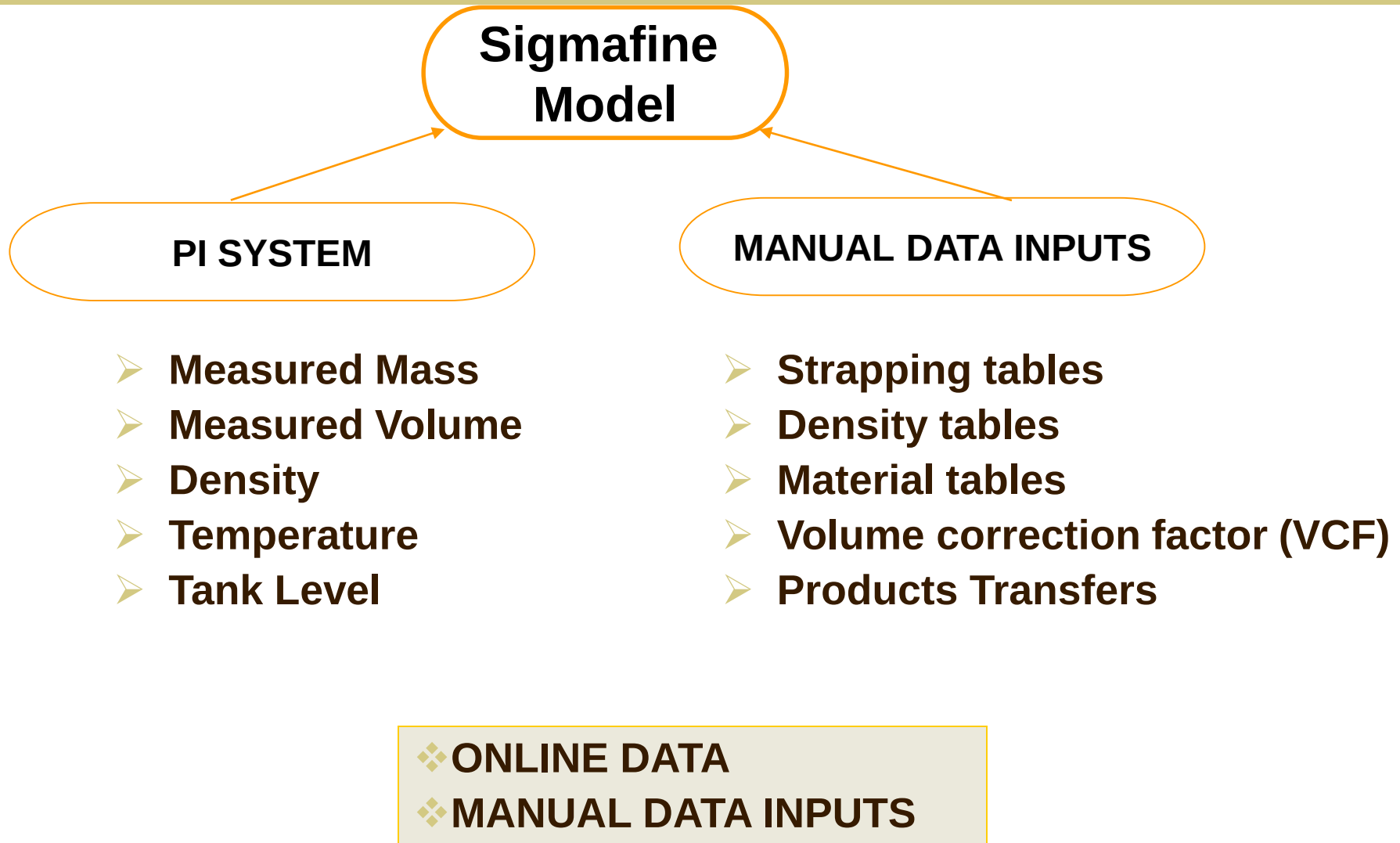


Sigmafine – Mass Balance -Model

- 756 elements
 - 320 Flows
 - 88 Nodes
 - 53 Gas Meters
 - 95 Liquid Meters
 - 19 Processes
 - 6 Receipt Points
 - 21 Shipment Points
 - 154 Tanks
- 180 Layers
- Strapping tables
- Density tables
- Material tables



Sigmafine –Data Inputs

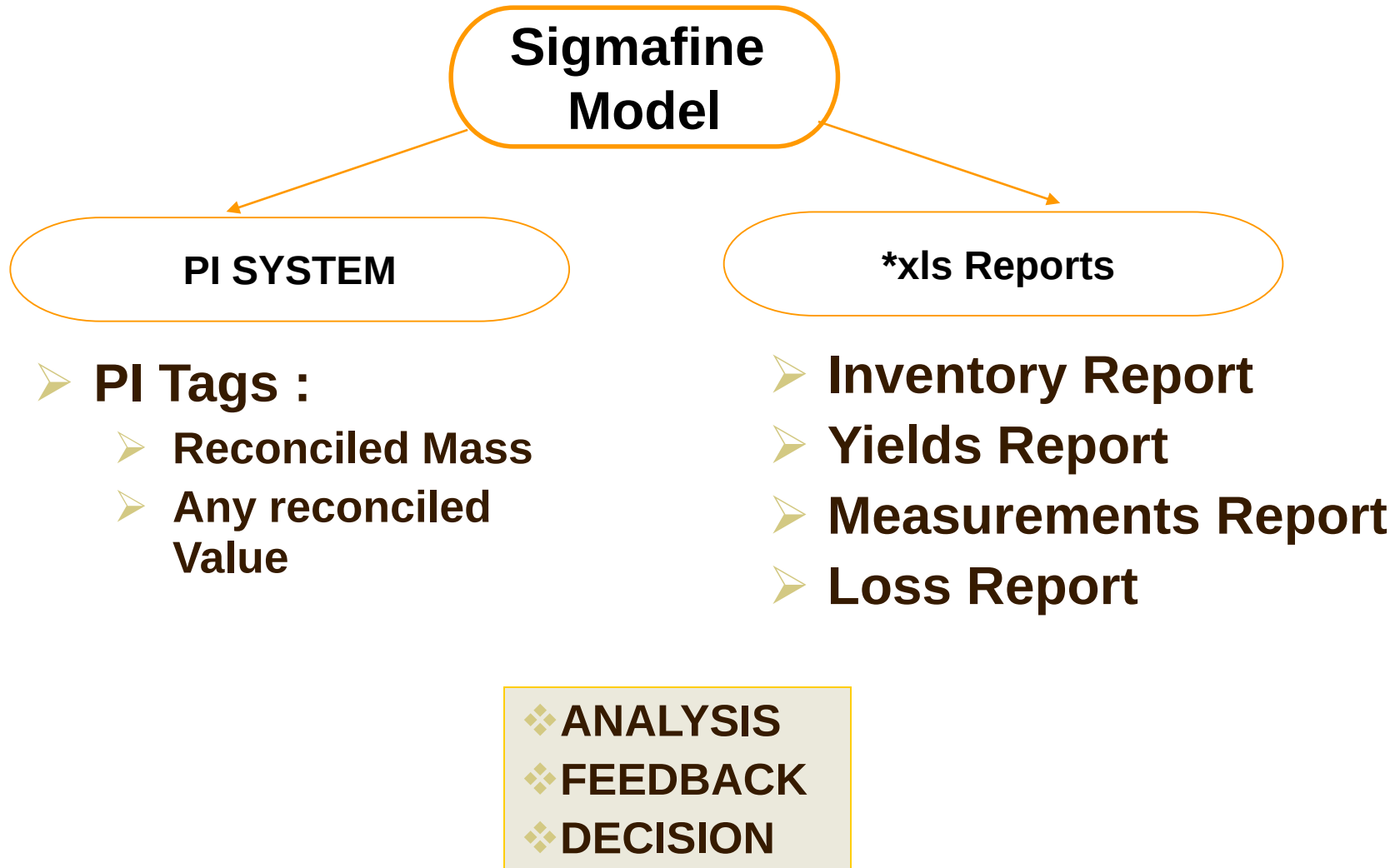


Sigmafine –Product Transfers

StartTime	EndTime	Source	Destination	MeasuredMass
3/1/2008 4:00	3/3/2008 2:00	Refinery Model\ReceiptPoint_Conpet_Titei	Refinery Model\Node_Titei	14097000
3/1/2008 4:00	3/3/2008 2:00	Refinery Model\Node_DILB	Refinery Model\ShipmentPoint_AFPE	6211000
3/1/2008 4:00	3/3/2008 2:00	Refinery Model\Node_GPL_REZ_OUT	Refinery Model\ShipmentPoint_GPL	927000
3/1/2008 4:00	3/3/2008 2:00	Refinery Model\Node_Cocs_CX_OUT	Refinery Model\ShipmentPoint_Cocs	1435000
3/1/2008 4:00	3/3/2008 2:00	Refinery Model\Node_GILB	Refinery Model\ShipmentPoint_AFPE	2085000
3/1/2008 4:00	3/3/2008 2:00	Refinery Model\ReceiptPoint_Gaze naturale	Refinery Model\Node_Gaze_naturale_IN	48000
3/1/2008 4:00	3/3/2008 2:00	Refinery Model\Node_Sulf_RS_OUT	Refinery Model\ShipmentPoint_Sulf	185000
3/3/2008 4:00	3/4/2008 2:00	Refinery Model\ReceiptPoint_Conpet_Titei	Refinery Model\Node_Titei	2069000
3/3/2008 4:00	3/4/2008 2:00	Refinery Model\Node_DILB	Refinery Model\ShipmentPoint_AFPE	4394000
3/3/2008 4:00	3/4/2008 2:00	Refinery Model\Node_Calor_Extra	Refinery Model\ShipmentPoint_Calor_Extra	25000
3/3/2008 4:00	3/4/2008 2:00	Refinery Model\C-99	Refinery Model\ShipmentPoint_Calor_Economic	69000
3/3/2008 4:00	3/4/2008 2:00	Refinery Model\Node_GPL_REZ_OUT	Refinery Model\ShipmentPoint_GPL	1382000
3/3/2008 4:00	3/4/2008 2:00	Refinery Model\Node_Cocs_CX_OUT	Refinery Model\ShipmentPoint_Cocs	1435000
3/3/2008 4:00	3/4/2008 2:00	Refinery Model\Node_GILB	Refinery Model\ShipmentPoint_AFPE	2085000
3/3/2008 4:00	3/4/2008 2:00	Refinery Model\ReceiptPoint_Gaze naturale	Refinery Model\Node_Gaze_naturale_IN	48000
3/3/2008 4:00	3/4/2008 2:00	Refinery Model\Node_Sulf_RS_OUT	Refinery Model\ShipmentPoint_Sulf	185000

***xls FILE
DAILY INPUTS
MANUAL DATA**

Sigmafine –Data Outputs

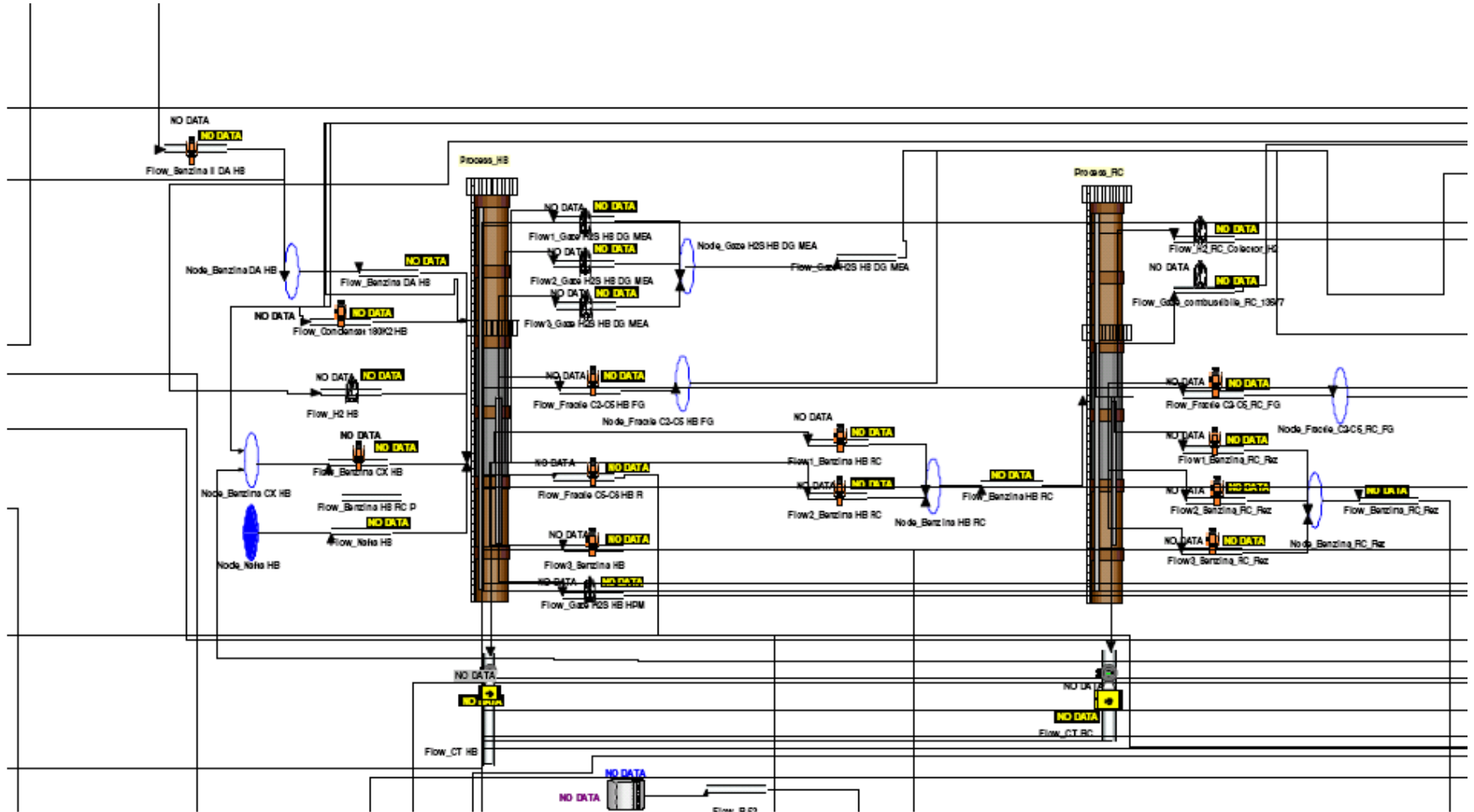


Sigmafine – Mass Balance - Analysis

The screenshot displays the AFExplorer application window. On the left, a tree view shows the project structure under 'Rom_test', including 'Models', 'Refinery Model', 'Elements', 'Layers', 'Model Analyses', and 'Element Templates'. The 'ModelAnalyses' folder is expanded, showing a list of analysis runs with dates and times. The 'ModelAnalysis_test1' entry is selected. The right pane shows the 'General' tab for the selected analysis. The 'Model Analysis' section includes fields for 'Name' (ModelAnalysis), 'Description' (test2), and 'Maximum Transfer Duration' (1 days). The 'Analysis Rule' section shows the 'Type' as 'Mass Balance' and a detailed 'Summary' of the analysis parameters. The 'Time Rule' section shows the 'Type' as 'Periodic' and a 'Summary' of the time schedule: 'Offset=14400;Day=Mon,Tue,Wed,Thu,Fri'. A yellow oval highlights the text 'DAILY BASIS ANALYSIS 24H, WEEKENDS'.

**DAILY BASIS ANALYSIS
24H, WEEKENDS**

Sigmafine – Mass Balance- Graphic Model



What we had and what we have now

2004	
BEFORE PI IMPLEMENTATION	AFTER PI IMPLEMENTATION
COLLECTING DATA = TIME CONSUMING ACTIVITIES	MORE TIME FOR ANALYSES
LIMITED HISTORY	LONG TIME DATA HISTORY
DELAY BETWEEN THE FACTS AND FEEDBACK	REAL TIME INFORMATION , REAL TIME ACTIONS
A HUGE MANUAL DATA INPUTS FOR REPORTS	HIGH QUALITY DATA INPUTS FOR REPORTS
ERRORS on NUMBERS	ACCURATE DATA ALL THE INFORMATION IN ONE PLACE
LIMITED DATA ACCESS	HIGH DATA AVAILABILITY

DATA from PI SYSTEM
=
QUALITY, AVAILABILITY, INTEGRITY
REAL TIME

Future Directions

PI System

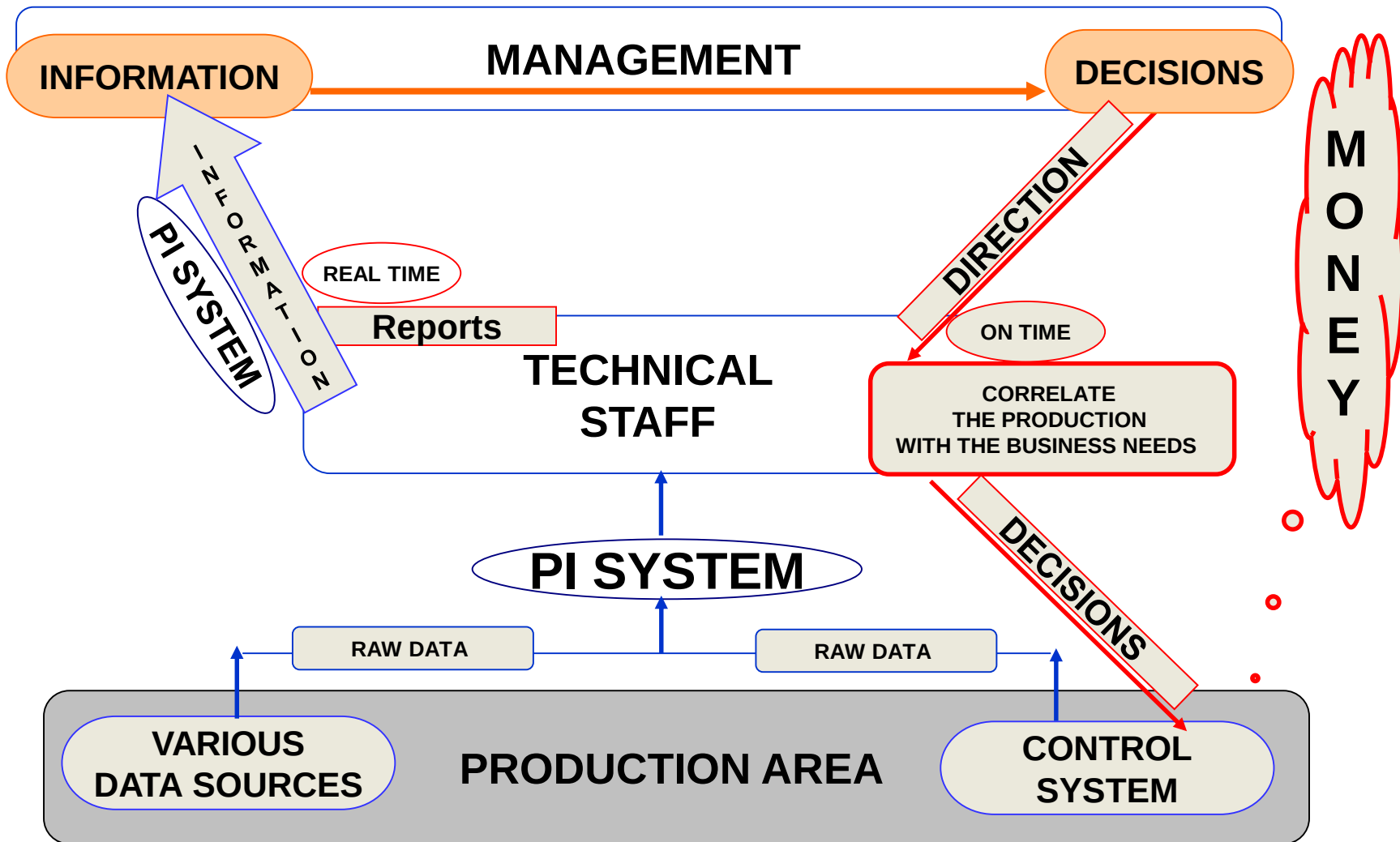
- Upgrading the PI system to ensure a PI solution for other sites
- Develop new applications for other areas:
 - Tanks Farm
 - Product Loading Terminal
 - Utilities Area

Sigmafine

- Improving the production Mass Balance Model
- Develop and implement a model for the Utilities

- ❖ PI SYSTEM for ANOTHER SITE
- ❖ SIGMAFINE MASS BALANCE
- ❖ SIGMAFINE for UTILITIES
- ❖ RT WEBPARTS
- ❖ ACE MANUAL DATA INPUTS

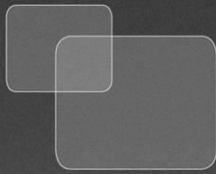
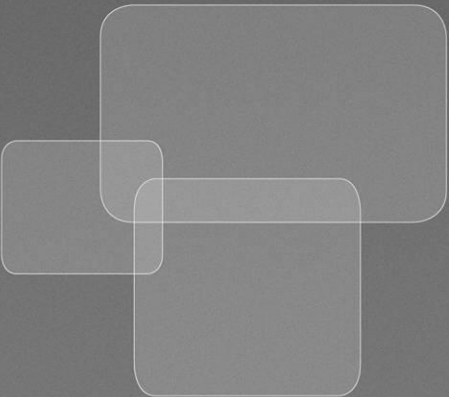
Conclusions





**WE ARE LOOKING FORWARD
TO ANSWERING ALL YOUR
QUESTIONS**

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THANK YOU