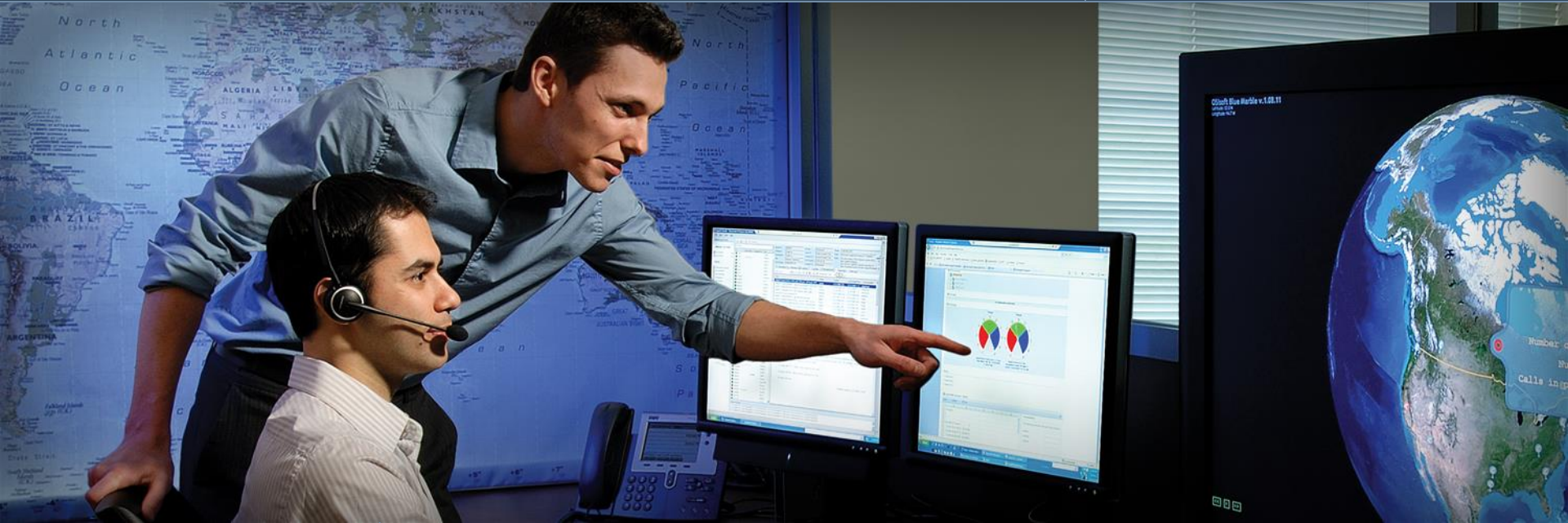




OSIsoft®

Regional Seminar Series



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

Ana-Maria Ciuculan
PI System Administrator
Rompetro

1 - October- 2009

Empowering Business in Real Time.

© Copyright 2009, OSIsoft Inc. All rights Reserved.

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



- The Rompetrol Group
- Rompetrol Refinery Information System and the OSIsoft products
 - OSIsoft products at Rompetrol Refinery
 - PI data sources
 - System Architecture
- Why PI ?
 - Excel 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

- 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



- 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.

- 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

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

OSIsoft licences at Rompetrol



Licensing - PI System Management Tools

File View Tools Help

Collectives and Servers

Search

Servers

- ☐ 10.13.8.12
- ☒ 10.13.8.4
- ☐ sharepoint

System Management Plug-Ins

Search

Recorded Values

- Interfaces
- IT Points
- Operation
 - Archives
 - Licensing**
 - Message Logs
 - Module Database
 - Network Manager Statistics
 - PI Services
 - PI Version
 - Reason Tree
 - Snapshot and Archive Statistics
 - Tuning Parameters
- Points

10.13.8.4

- General
- Usage
- ID History
 - b49dc413-041c-463b-9907-02b1bcd87c0c
 - 765f55a5-b86f-4585-91e7-1460d78f2991
- Programs
- Resources
 - piarchss.MaxHistory
 - piabess.MaxAggregatePointModuleCount
 - Total: 30016
 - Amount Used: 20290
 - Amount Left: 9726
 - End Time: Never
 - piabess.MaxModuleCount
 - piabess.MaxNonCCPointCount
 - piabess.MaxPointCount
 - pinetmgr.MaxAPIConnections
 - pinetmgr.MaxSDKConnections
- Seats

My Products - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites

Address <http://techsupport.osisoft.com/techsupport/NonTemplates/MyProducts.aspx>

OSIsoft. GLOBAL

MY SUPPORT | PRODUCTS | DOWNLOAD CENTER | KNOWLEDGE CENTER | CONTACT US

My Products

MY SUPPORT

- My Profile
- My Calls
- My Products**
- My Download
- History
- SRP Terms

Organization: S.C. Rompetrol Rafinare S.A.

Site:

Site Number: 5013133*

*Use this number when registering for OSIsoft Training Webinars

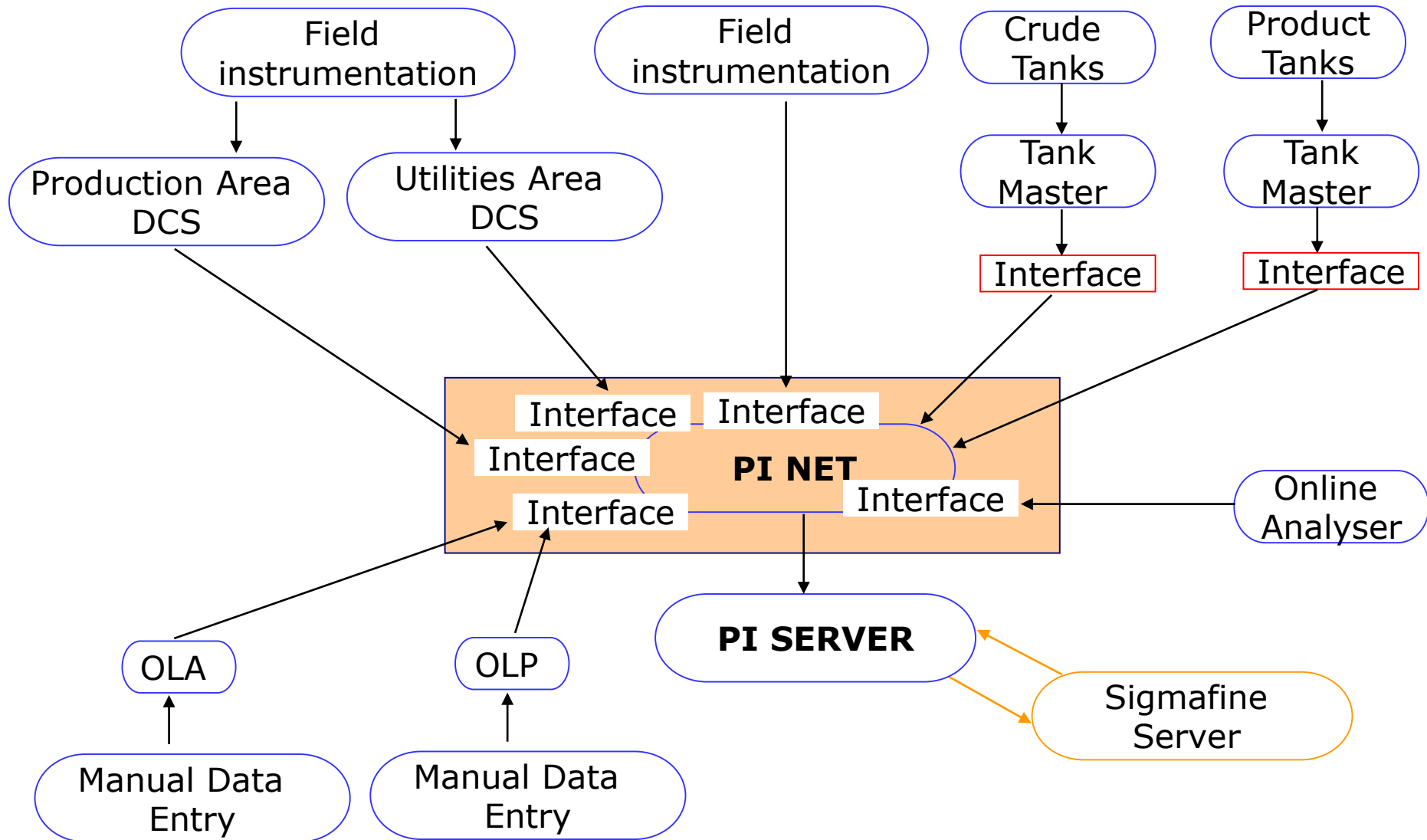
Serial #	Description	License	Download End	Download
3100322	PI Development Server	Development - Customer	06-Dec-2007	Download
7825	Enterprise Server	Production	31-Dec-2007	Download
7825	Sigmafine 4.x Server	Production	31-Dec-2007	Download
1054891	ComboPack	Production	31-Dec-2007	Download
8000006	Sigmafine Client Add-in Kit	Production	31-Dec-2007	Download

Session Record

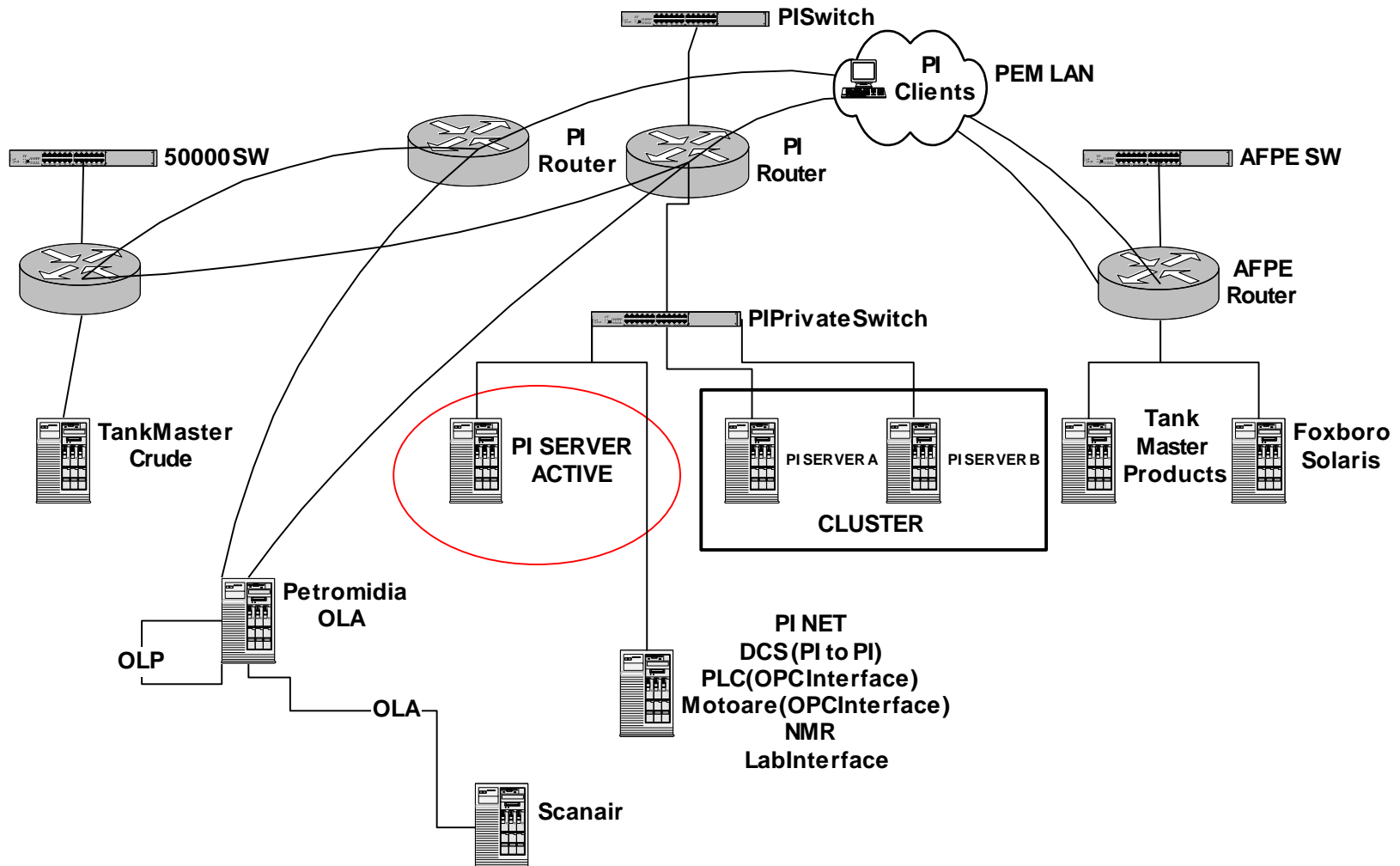
- **Field instrumentation**
 - PLCs
 - DCS for Production Area
 - DCS for Utilities Area
 - Tank Master for Crude Tanks
 - Tank Master for Products Tanks
 - NMR- online analyzer
- **Manual Data Entry**
 - Lab - OLA
 - Process Information - OLP
- **Blending system**
- **Sigmafine**

**Information Gathered
from
Different Sources**

Data sources and interfaces



Overview: System Architecture



- ❖ **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**

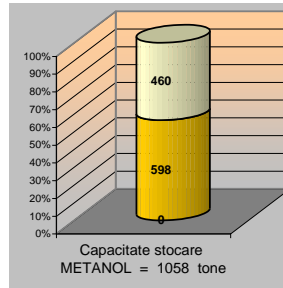
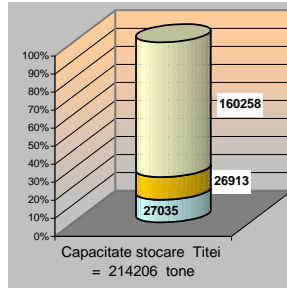
Equipment Health and Period of On-line Operation

Management Report - Storage Space

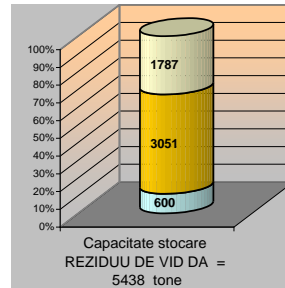
Stocuri&Capacitati de stocare

8/28/08 2:00 PM

Materii Prime



Reziduu

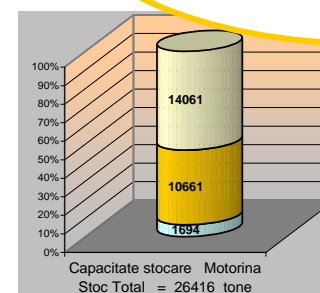
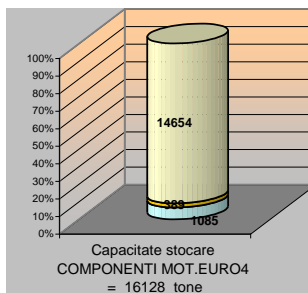
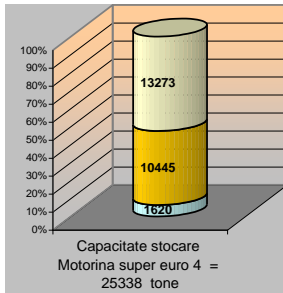
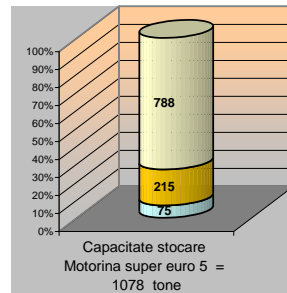


Spatiu liber
 Pompabil
 Nepompabil

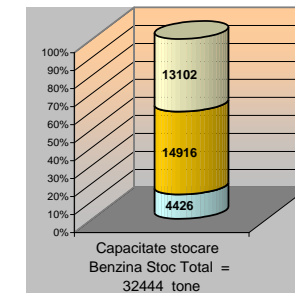
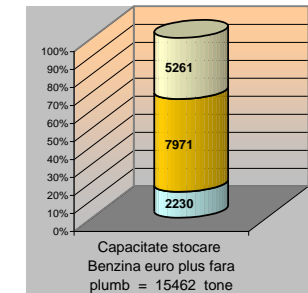
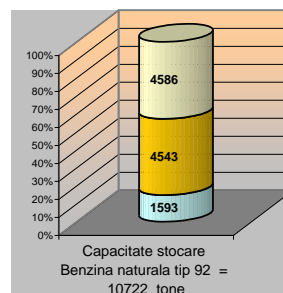
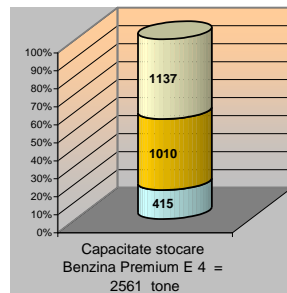
Date PI

**VISUALIZATIONS
Based on
PI DATA**

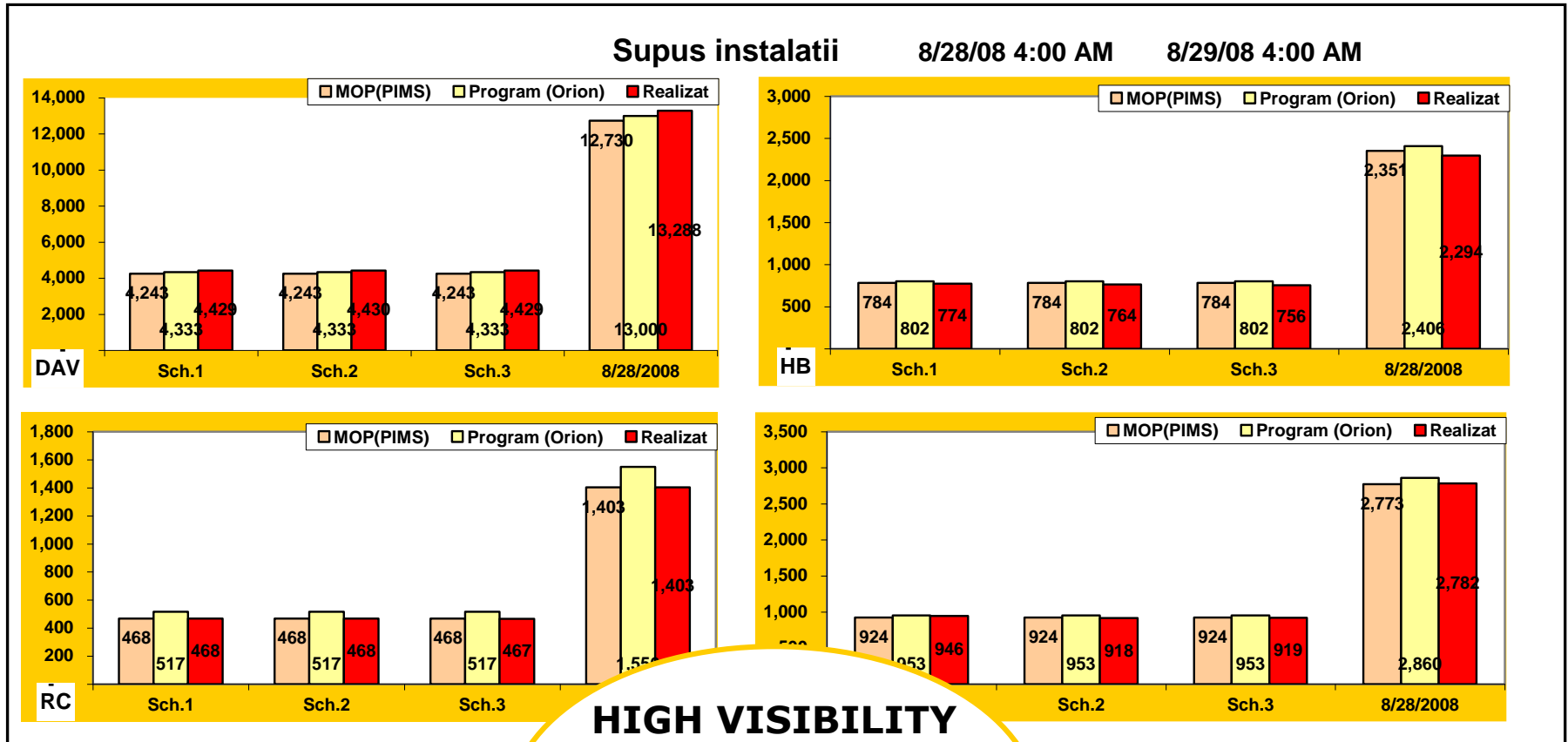
Motorine



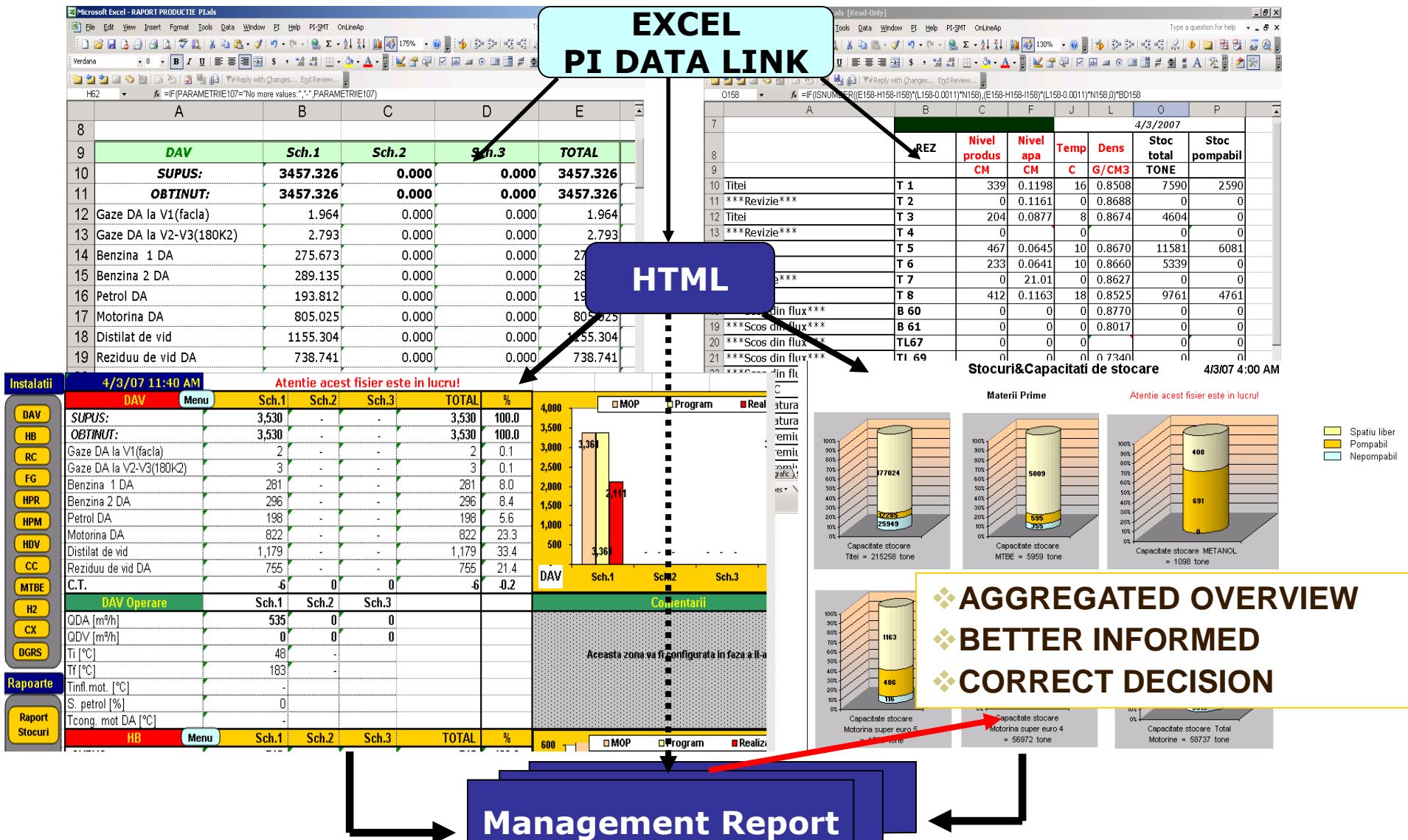
Benzine



Management Report - Production



From EXCEL to HTML





Engineers Report



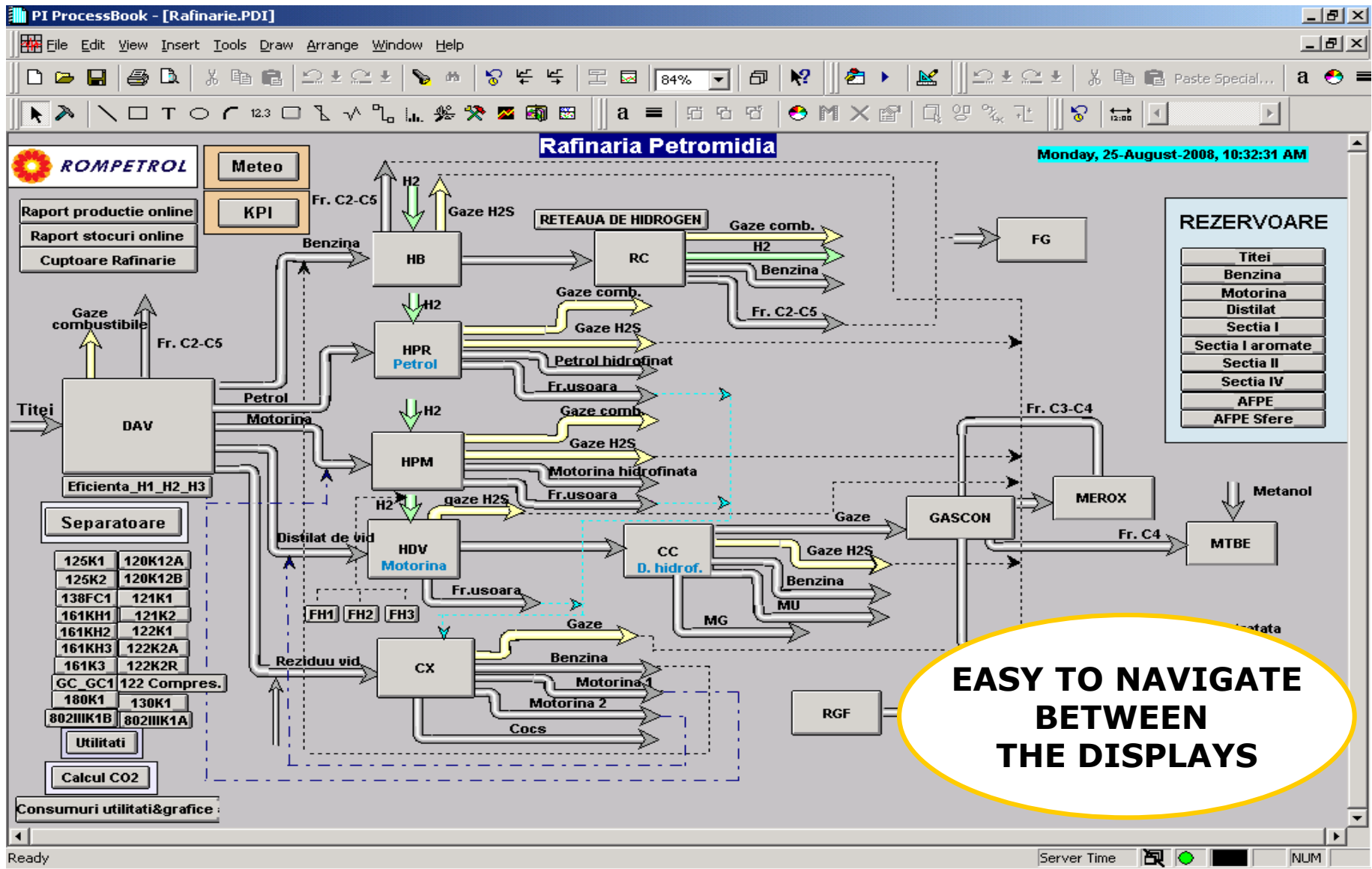
Management Report

- High speed for report upload
- Graphic visualization
- Multiple possibility 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 the INFORMED DECISIONS

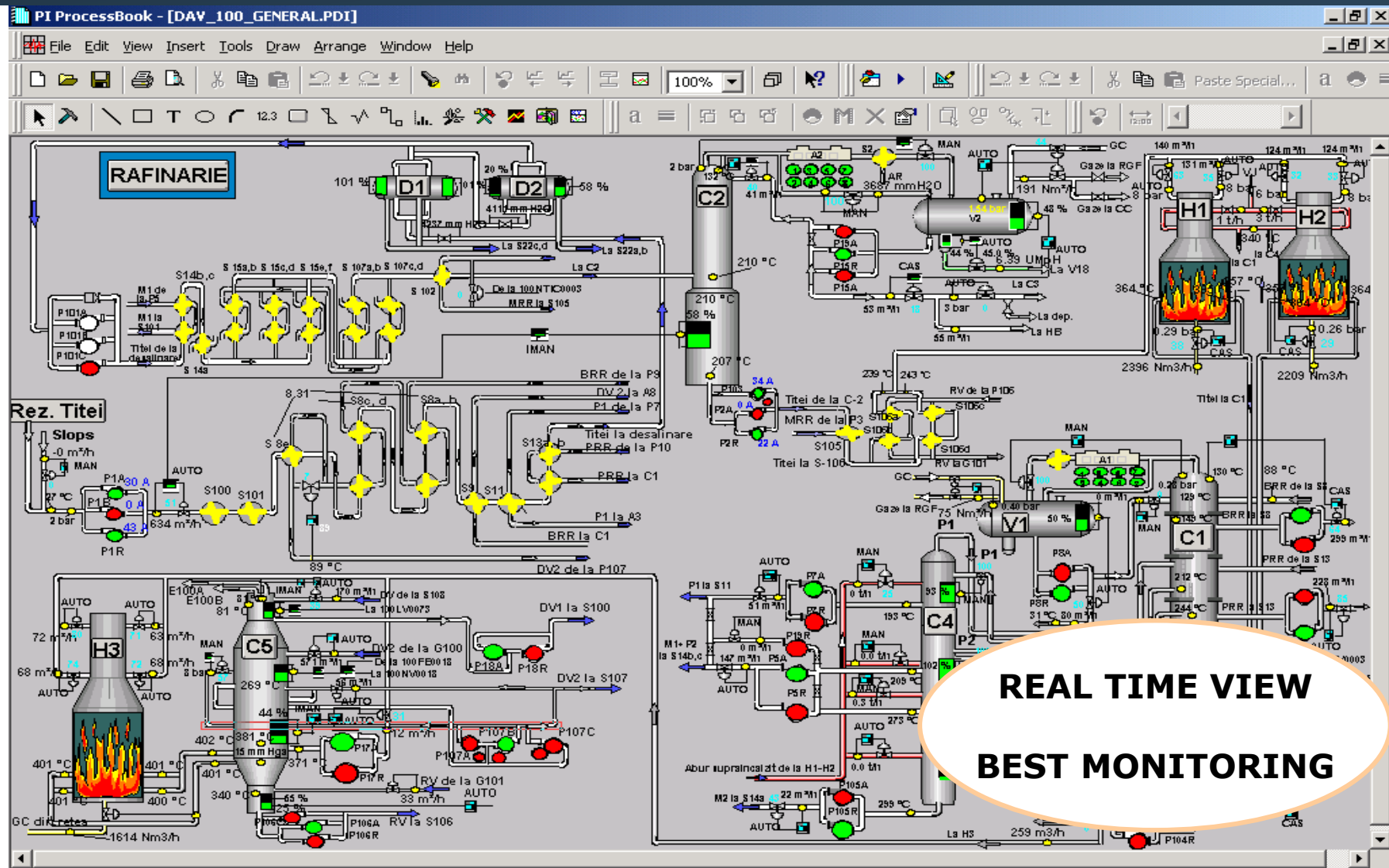


**Valuable information
In Real Time
To Any Place**

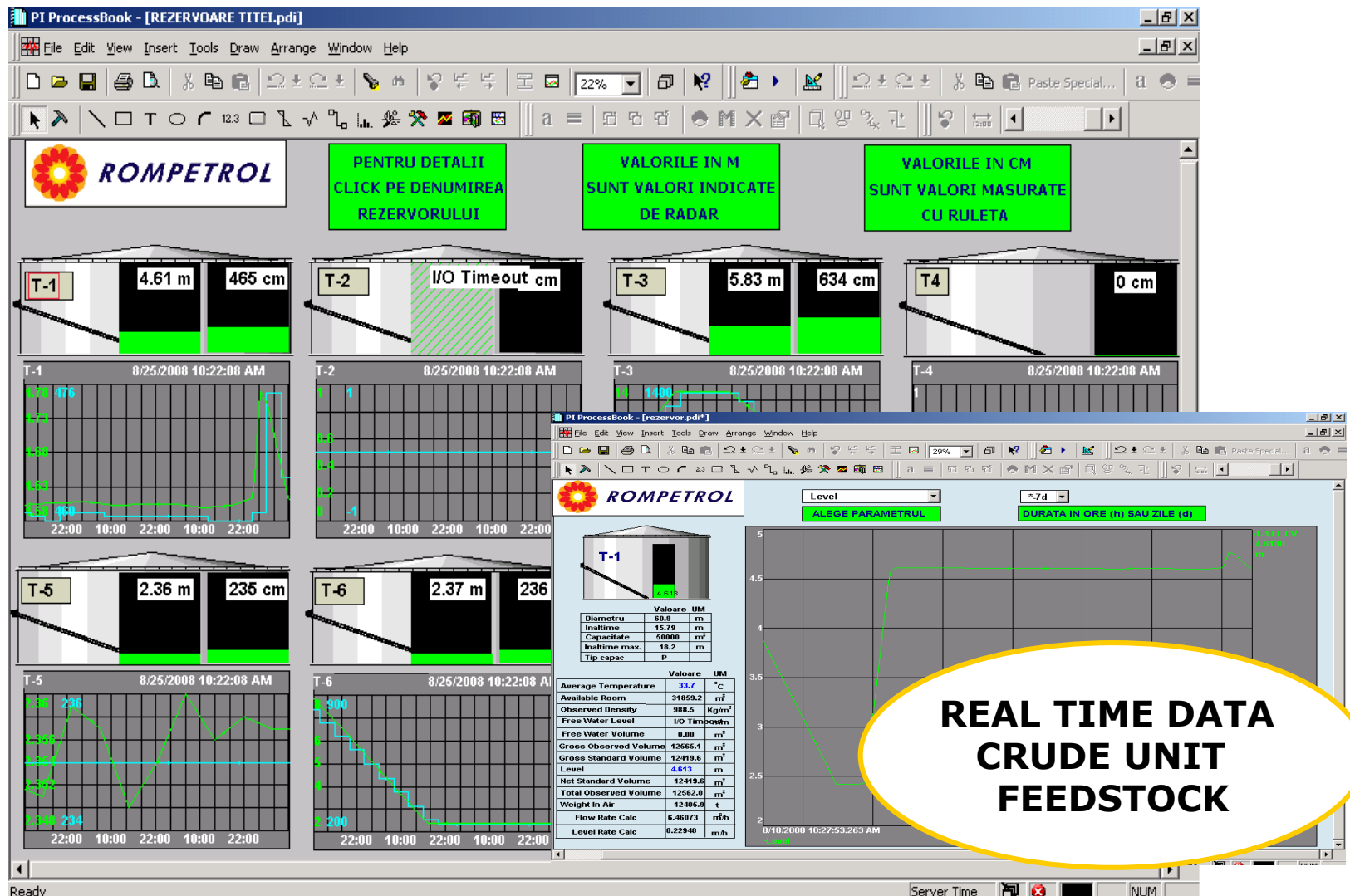
Rompetrol Refinery - PI Process Book



Crude unit

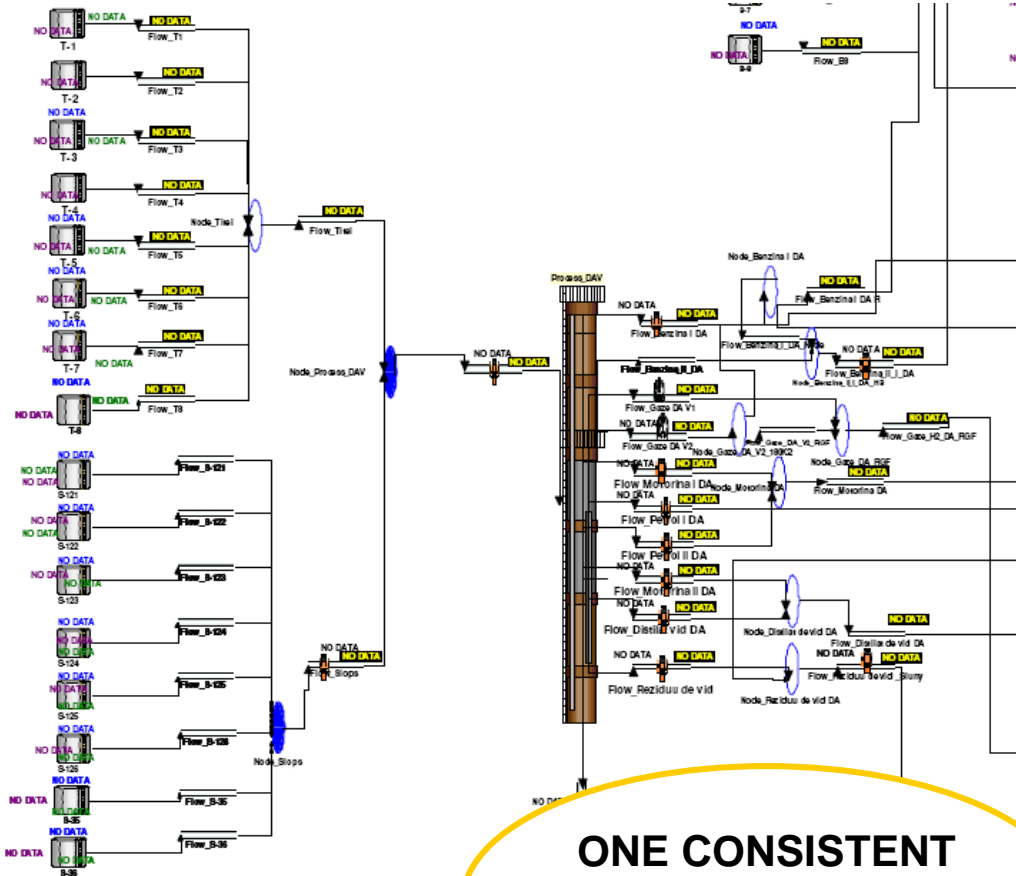


Crude oil - tanks

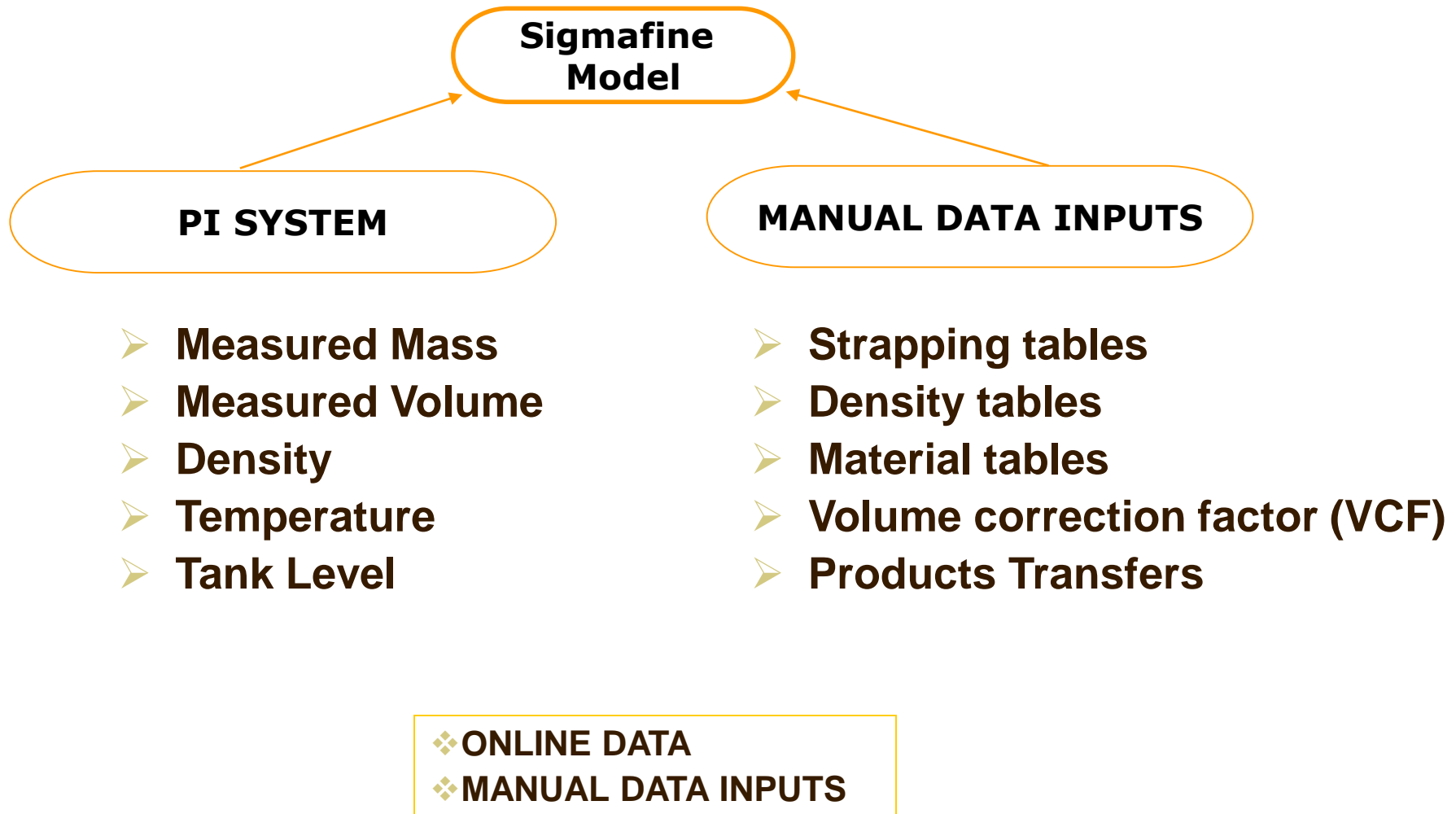


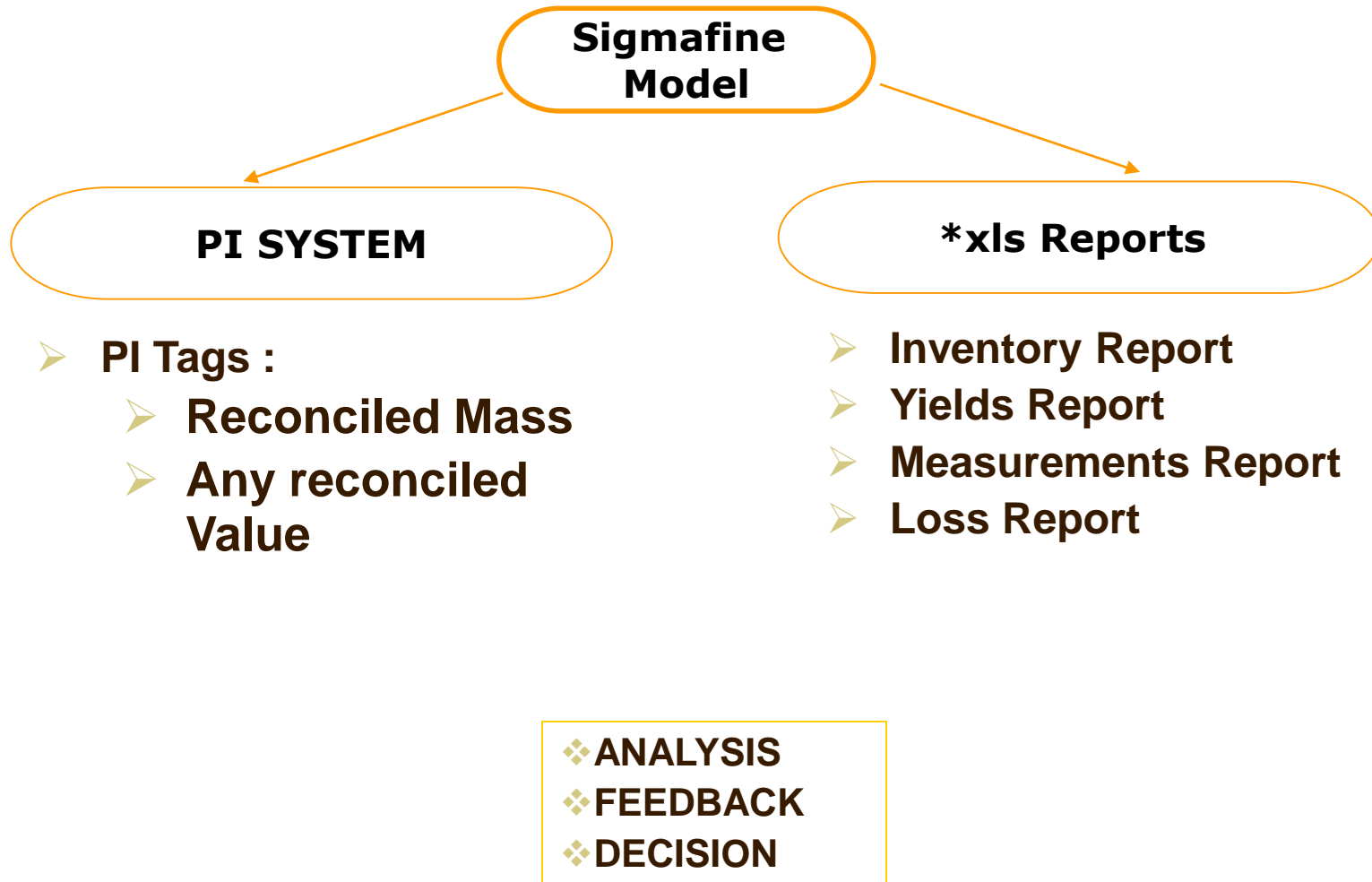
Sigmafine - Mass Balance -Model

- 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



**ONE CONSISTENT
MODEL
for REFINERY**





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**

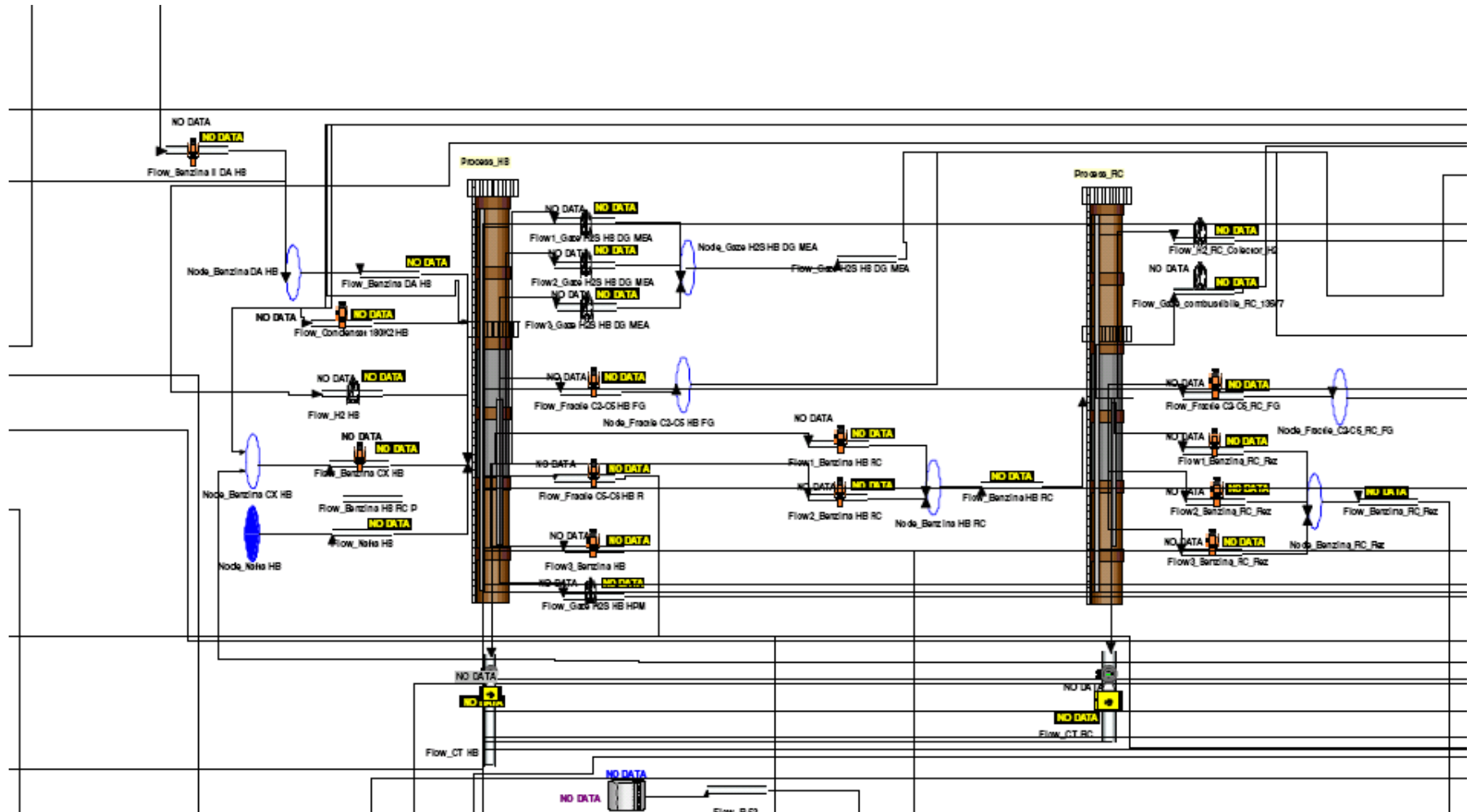
Sigmafine - Mass Balance - Analysis



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 'ModelAnalysis_test1'. The 'ModelAnalysis' entry is selected, showing a list of analysis runs with dates and times. 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 schedule: 'Offset=14400;Day=Mon,Tue,Wed,Thu,Fri'. A yellow oval highlights the text 'DAILY BASES ANALYSIS 24H, WEEKENDS'.

**DAILY BASES ANALYSIS
24H, WEEKENDS**

Sigmafine - Mass Balance- Graphic Model



What we had and what we have ?

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
LIMITED DATA ACCESS	HIGH DATA AVAILABILITY

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

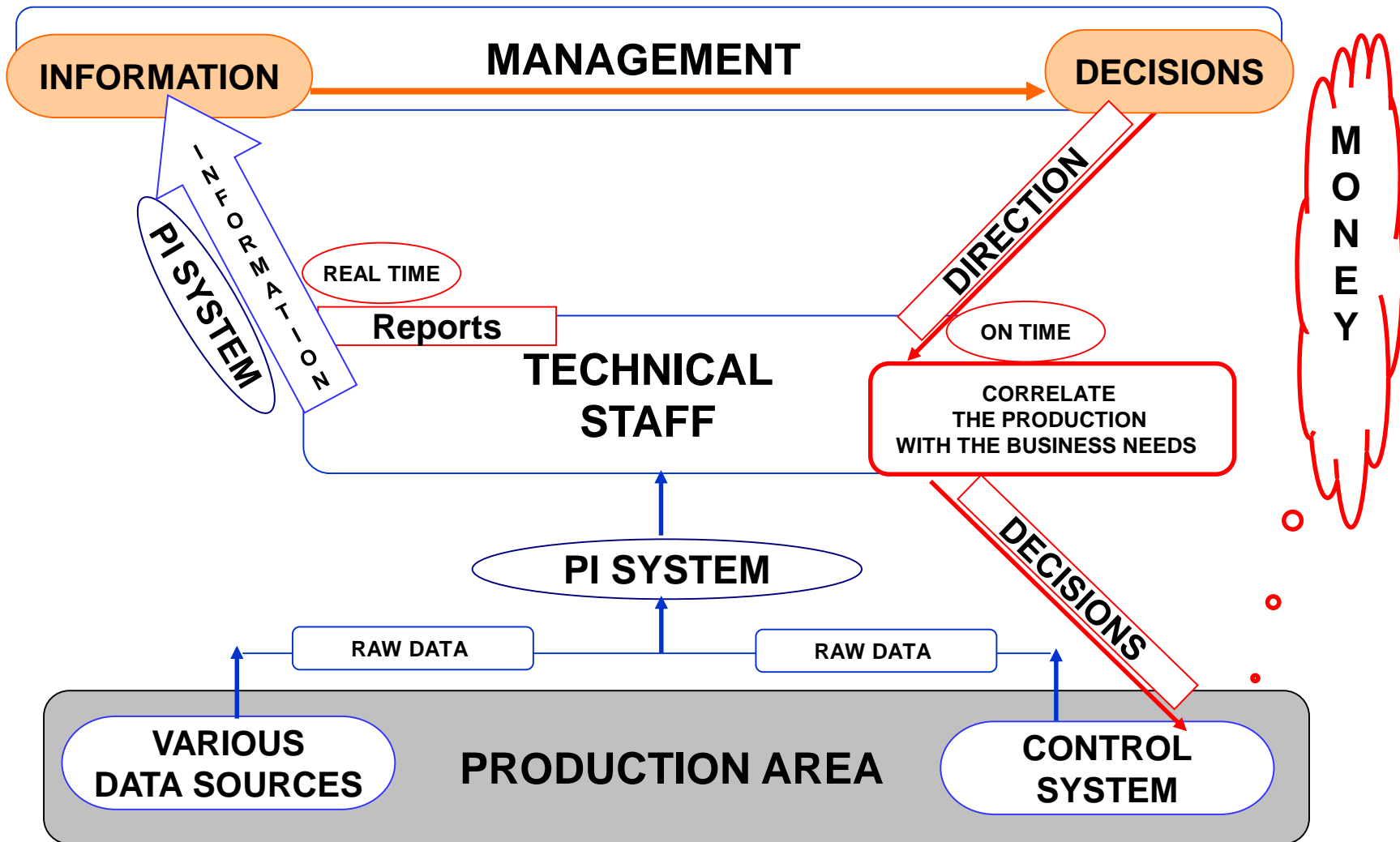
PI System

- 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**



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



Thank you

© Copyright 2009 OSIsoft, Inc.

777 Davis St., Suite 250 San Leandro, CA 94577