



Unit Yield Performance and Plant Production Accounting with the Sigmafine/PI System Infrastructure

Bryan Sower, Dow Corning

Presented by

Roberto Linares, Pimsoft

DOW CORNING

We help you invent the future.™

Dow Corning - The silicone technology pioneer...

- Organized to explore the potential of the silicon atom in 1943
- A global leader in silicones and high purity silicon
 - More than 7,000 products/services
 - Approx. 25,000 customers
 - Approx. 12,000 employees
- An equally owned venture of The Dow Chemical Company and Corning Incorporated



DOW CORNING

We help you invent the future.™

Bryan Sower

PI Technology Steward at Dow Corning



Appliance



Assembly & Maintenance



Automotive



Beauty & Personal Care



Chemical Manufacturing



Construction



Electronics



Food & Beverage



Healthcare



Household & Cleaning



Imaging



Oil & Gas



Paints & Inks



Plastics



Power & Utility



Pressure Sensitive



Pulp & Paper



Rubber Fabrication



Solar



Textiles, Leather & Nonwovens

DOW CORNING

We help you invent the future.™



Dow Corning - Pimsoft – OSIssoft, a partnership



PiMSOFT
INNOVATIVE SOLUTIONS



DOW CORNING

We help you invent the future.™

Pimsoft brings innovative solutions and engineering skills to industries where real-time operational intelligence and mission critical systems are key factors for companies committed to delivering successful services and products.



Dr. Roberto Linares
Vice President, Pimsoft



Dow Corning is ...

- A global leader in silicones and high purity silicon
 - More than 7,000 products/services
 - Approx. 25,000 customers
 - Approx. 12,000 employees
- \$6.12 billion sales in 2012
- Investing in our future and our customers' futures: geographic, manufacturing, innovation
- Transforming our business to deliver:
 - Efficiency, Innovation and Sustainability
- Focused on sustainability and *Responsible Care*®



Manufacturing Sites



DOW CORNING

We help you invent the future.™

Introduction

- Bryan Sower
 - PI Technology Steward
 - Working with the PI System since 1998
 - Part of Global Manufacturing Automation(GMS) group
- Sigmafine
 - Current Version : 4.4.3.1793 AF Version: 1.3.3.1474
- OSIsoft
 - Current PI Server Version: PI Server 2010(EA /Managed PI)
 - IT Monitor
 - 20+ PI Collectives Globally
- Other Significant software
 - SAP ECC 6.0 (single instance globally)
 - Thermo Electron Sample Manager(LIMS)
 - Web based Radio Frequency (RF) interface to the PI System and SAP
 - Various Control Systems (one of everything)



The Problem

- Several different solutions and components developed at different sites and by different organizations to perform accounting mass balance over the last 14 years.
 - Excel solution
 - Edict/ACE solution
 - Custom applications to perform SAP integration to extract information needed from SAP and to execute SAP transactions
- Some solutions were difficult to support and maintain
- Difficult for new users to learn
- Low degree of flexibility
- Execute a fairly high volume of SAP transactions which insure that inventory levels are timely and accurate.
- Need a more comprehensive standardized solution that is easily supportable and would grow with our needs



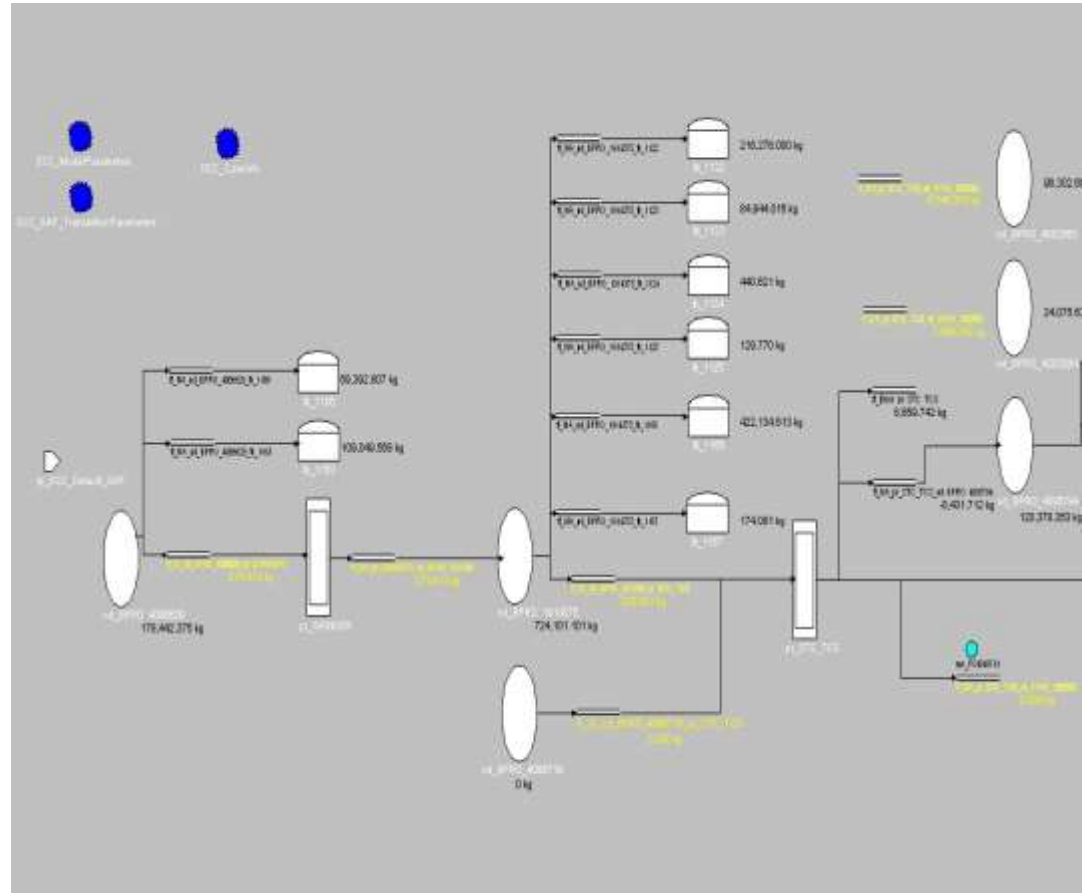
The Plan

- Pilot Sigmafine at two key sites with different legacy solutions
- Take a new more comprehensive approach to accounting mass balances for the company
- Establish documented standards for how we model and execute an accounting mass balance
- Design the solution to be SOx compliant and easy for auditors to understand
- Make it easy to support, maintain and troubleshoot
- Take the best features from the legacy solutions and incorporate those where possible.
- The solution must be able to run unattended and recover from errors and SAP outages with variable case durations.
- Develop a natural workgroup of Sigmafine users that can coach and support each other



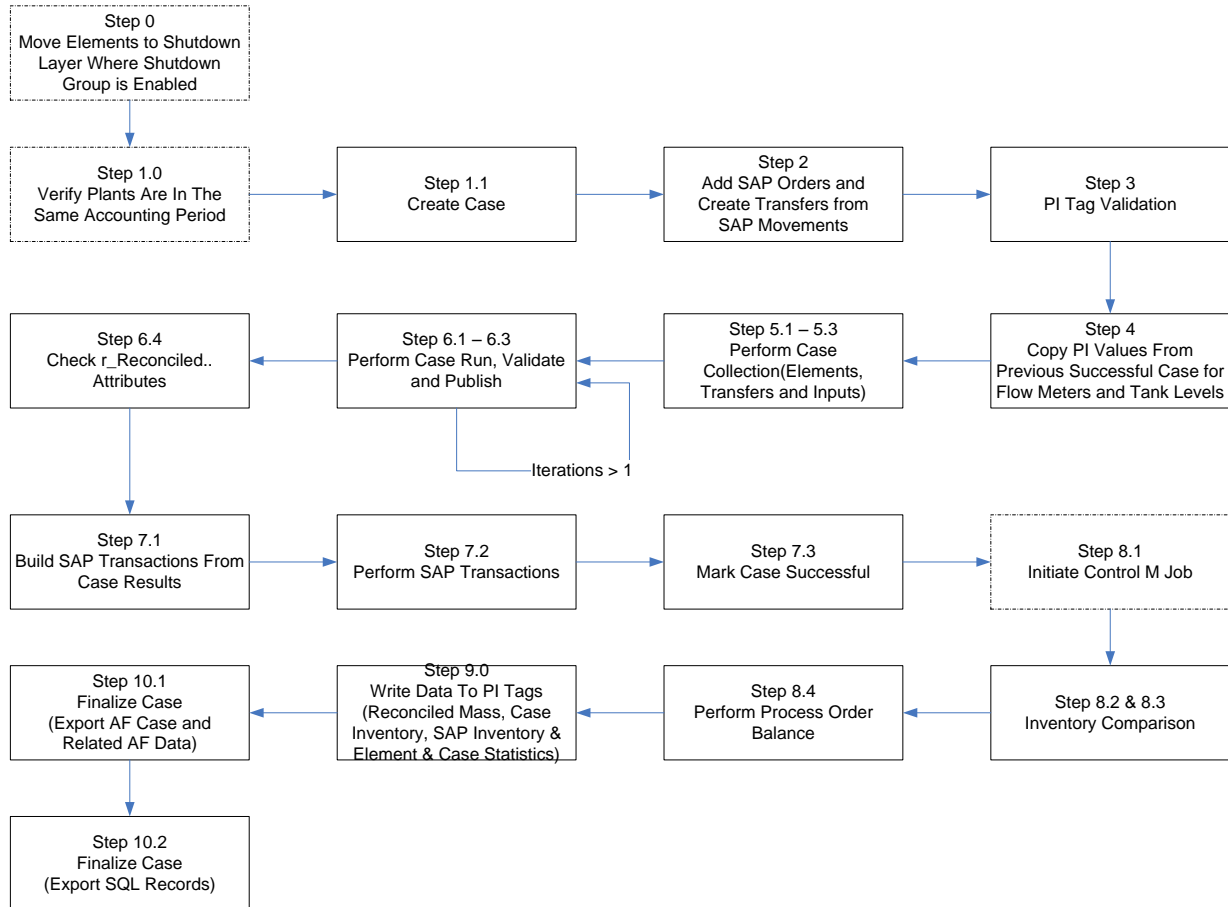
The Solution – Model Development

- First step training – Combined three day on site training course with 2 day coaching session
- Build database from template database with predefined element templates and example elements
- Standardize element naming to simplify modeling and troubleshooting
- Utilize standardized Excel workbooks with the add-ins for PI AF and Sigmafine to facilitate element definition
- Create custom data references if necessary



The Solution – Processing Steps

Dow Corning Sigmafine Automated Accounting Balance



The Solution – SAP Integration

- Reuse and upgrade custom RFCs and .Net application from legacy application for retrieving process order information, movements and inventory quantities.
 - Criteria for queries dynamically built from the element attributes
 - Utilize SAP Resource Network to assist in identifying the correct process order to use
 - Table look-up data references to find the correct Process Order for a given case
 - Movement data used to build transfers
 - Inventory data used after transactions from the case are processed to compare with inventory levels in SAP to highlight any issues.
- SAP transactions processed in real time with custom RFC and .Net application for immediate feedback.



The Solution – PI Data

- Copying of data from previous successful case for tank levels and totalizers
 - Eliminate issues with compression from case to case
- Perform tag and data validation
 - The PI Data is a critical part of the case processing and the validation by Sigmafine was not comprehensive enough
 - Needed the ability to decide what to do on an element by element basis how to handle validation failures
- Validation Rules
 - Rule 0 – Valid PI Server and tag
 - Rule 1 – Good data at start/end of case
 - Rule 2 – Value is not older than maximum age(Snapshot .vs Current Time)
 - Rule 3 – Minimum percent of good data for case time range
 - Rule 4 – Reasonableness check of value to defined Minimum and Maximum
- Validation Options
 - Ignore - Continue on with the case execution
 - OutOfService - Mark element OS and continue
 - DoNotCalculate - Halt execution



The Solution – Interactive Application

Current Case

Case Case 3/24/2010 11:00:01 PM - 3/25/2010 5:00:00 AM Debug Level 2 View Log File Reprocess SAP Transactions Test Web Services

Case Runner

Create Case Initialize Case PI Tag Validation Copy Previous Case PI Values Case Collects Case Validate, Run and Publish Write Case Results To PI SAP Transactions Inventory Comparison Finalize Case

Execution Output

Main Case Details Case Output

No.	Process Order	Material No.	Batch ID	Planned Start	Planned End	SAP Plant	Resource Network
1	000104640123	01914375		2/25/2010 0:00	3/13/2010 0:00	0136	GRINDER
2	000104640121	04082563		2/25/2010 0:00	3/10/2010 0:00	0136	STC_TCS

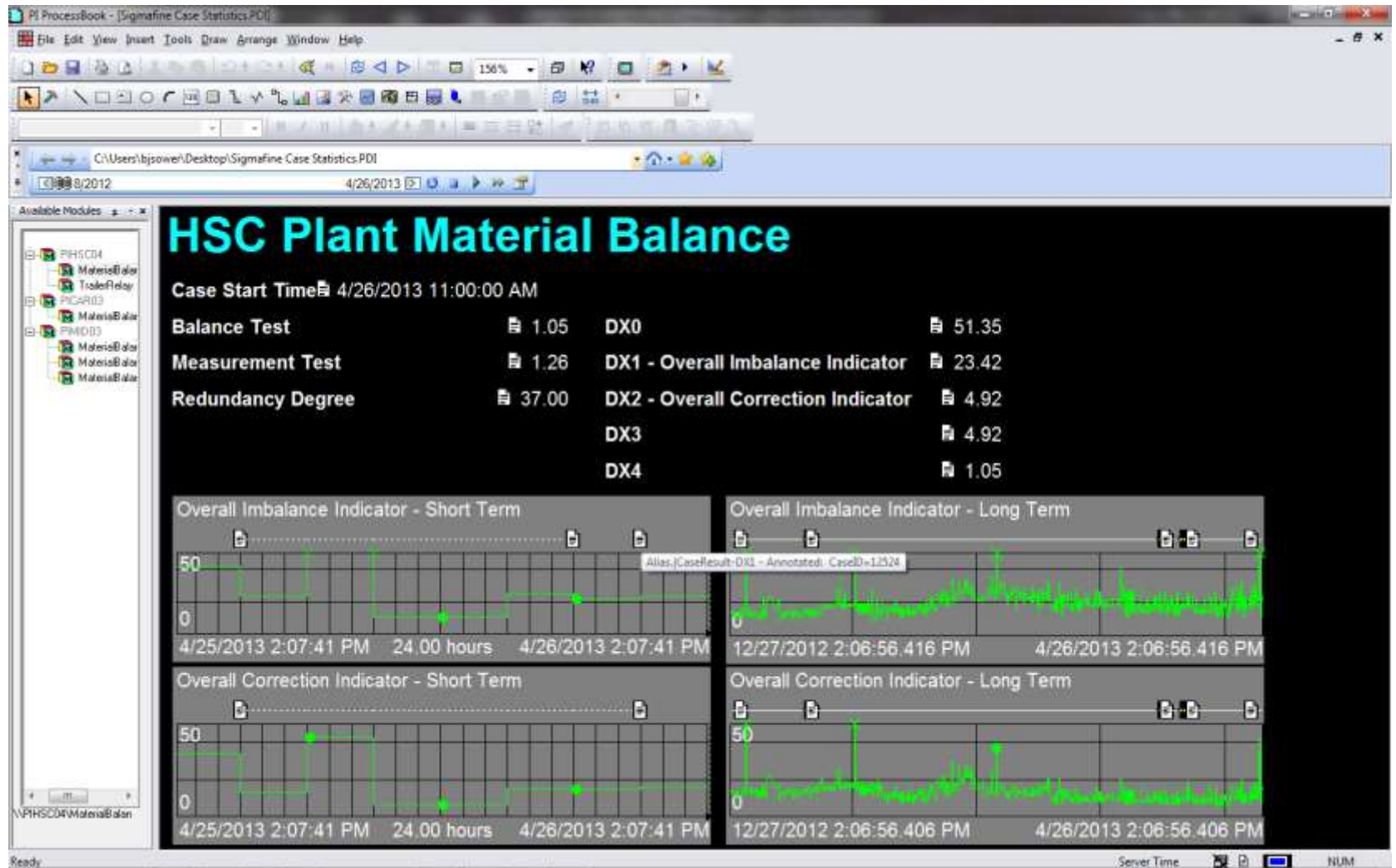
Process Orders

PIZJG03 | ZJGMatBal1 | DCCModel | Material Balance | ...

DOW CORNING

We help you invent the future.™

The Solution – Case Reconcile Metric History



DOW CORNING

We help you invent the future.™

The Solution – Reconcile Performance EMail

This message was sent with High importance.

From: HSCMTBL@SMTP.DowCorning.Net
 To: HSC:Signaline Mass Balance
 Cc:
 Subject: Case 12524 - 55 Flow Meters With Reconcile Quality Issues

Sent: Fri 4/26/2013 11:26 AM

Message | MaterialBalance_MaterialBalance_Case-12524_4-26-2013_8_00_01_AM_4-26-2013_11_00_00_AM Log.csv (85 KB)

No.	CaseID	Element	MeasuredMass	MassTolerance	ReconciledMass	Test1	Test1Validation	Action	Status
1	12524		0.001	1	115.22894256	134.3889		1 Warn	Test1 above limit
2	12524		605.3641478	30.26820739	1399.2067824	30.5881		1 Warn	Test1 above limit
3	12524		41734.751	1252.04254	55647.21836338	6.7317		1 Warn	Test1 above limit
4	12524		964	28.92001	911.13504816	-1.2624		1 Warn	Test1 above limit
5	12524		142845.925210669	4285.37776632007	109413.799062439	-9.0987		1 Warn	Test1 above limit
6	12524		493.8805518268	1	360.9313332868	-155.0569		1 Warn	Test1 above limit
7	12524		12242.8003659973	0.1	12244.1288991373	15.4945		1 Warn	Test1 above limit
8	12524		52047.001	1561.41004	40783.2975489	-8.4134		1 Warn	Test1 above limit
9	12524		594.6991353	29.734956765	1360.81708982	30.0493		1 Warn	Test1 above limit
10	12524		13307.7280569056	399.231851707168	6451.3409900256	-20.1153		1 Warn	Test1 above limit
11	12524		2322.26538313257	1	2189.31616459257	-155.0569		1 Warn	Test1 above limit
12	12524		11008.001	330.24004	298953.78380468	539.846		1 Warn	Test1 above limit
13	12524		61311.9097607604	1839.35730282281	46169.5210274404	-9.6014		1 Warn	Test1 above limit
14	12524		605.3950353	30.269751765	1399.31868045	30.5897		1 Warn	Test1 above limit
15	12524		631.0846103	31.554230515	1493.81720335	31.8878		1 Warn	Test1 above limit
16	12524		1457.8396551957	1	1324.8904366557	-155.0569		1 Warn	Test1 above limit
17	12524		608.8367853	30.441839265	1411.81321026	30.7636		1 Warn	Test1 above limit
18	12524		80361.8106626483	2410.85432987945	43486.9334844183	-17.8388		1 Warn	Test1 above limit
19	12524		675.3816978	33.76908489	1663.47874481	34.126		1 Warn	Test1 above limit
20	12524		0.001	4E-05	0.0010386	1.1255		1 Warn	Test1 above limit
21	12524		37095.5690480862	1112.86708144259	60106.6487622962	22.95		1 Warn	Test1 above limit
22	12524		360554.507175136	10816.6352252541	339188.763967426	-2.3037		1 Warn	Test1 above limit
23	12524		2248.69723607411	1	2115.74801753411	-155.0569		1 Warn	Test1 above limit

DOW CORNING

We help you invent the future.™

Current Status - Sigmafine

- Sigmafine installed at 5 sites
- Complexity of models vary from about 5000 elements in a single model to less than 100.
- Totals for all sites since implementing
 - 24,000 Cases
 - 3,000,000 SAP Transactions

PiMSOFT
INNOVATIVE SOLUTIONS

DOW CORNING

We help you invent the future.™

Current Status – The PI System



“Our mission is to maximize the Value our customers get from our product and services”

- 1st PI Server Installed in 1995
- 19 PI Collectives For Manufacturing Sites
- 3 Regional IT Monitor Servers
- 5 Sigmafine PI Servers
- 500,000+ PI Tags In Service
- Key Applications Utilizing PI Data
 - Process Monitoring And Analysis
 - TEEP/OEE
 - Transactional Automation with SAP
 - Regulatory Reporting
 - Monitoring and Collection of Historical Data for Key IT Assets
 - Many Custom MII Applications

The Learning's – Part 1

- Terminology
 - Make sure that everyone, especially each engineer, is clear that this is an accounting mass balance and not what they normally think of as a mass balance.
- Training
 - It works best to have onsite training for a week where the standard course is compressed to 3 days and the remaining 2 days are for coaching
 - Have some members of the natural work group attend the training to provide input and continuity from implementation to implementation
- **Model Development**
 - **Spend the time up front to create your template PI AF database with element templates and example elements. Remember this is an accounting mass balance so get rid of those attributes that do not apply and keep things as simple as possible**
 - **Have Sigmafine back for additional coaching sessions if needed**
 - **Element definition and configuration goes pretty quickly, but defining the relationships of the elements can be time-consuming and tedious**
 - **Don't be afraid to create your own data references if necessary, they can be pretty easy.**

The Learning's – Part 2

- SAP Integration
 - This is the where the most custom development will occur. Try to leverage standard RFC and BAPI's provide by SAP if possible
 - Utilization of the Resource Network in SAP to assist in mapping of process orders to elements can be very useful
- Automation
 - One of the biggest benefits we see is the ability to execute the accounting mass balance at a set frequency and notification of any issues that were encountered. It gives much better visibility of issues
- **Unexpected Benefits**
 - **Better understanding of processes, data, instrumentation and SAP work flows**
 - **Improved visibility of financial impact of process operations**
 - **Improved change control process at many levels**
 - **Identification and increased awareness of critical instrumentation and process measurements. Added new PI tag attributes for identifying critical tags.**

Sigmafine

Roberto Linares, Ph.D.

=

=

=

May 1, 2013

Sigmafine Evolution

What is Sigmafine?

- Sigmafine is a system designed to improve and validate the quality of the plant data to enable optimum operating and business decisions
- Sigmafine supports several types of balances and analyses such as Mass, Component, Volume, Energy, and Composition Tracking

Sigmafine has evolved it is not just a ...

- data reconciliation application

It is also a Validation tool, Analysis engine and a Business reporting platform!

- production accounting application

It is also Data Reconciliation, Composition Tracking, and More...!

- applied to oil refining

But also to Petrochemicals, Metals and Mining, Power, LNG facilities and Water!

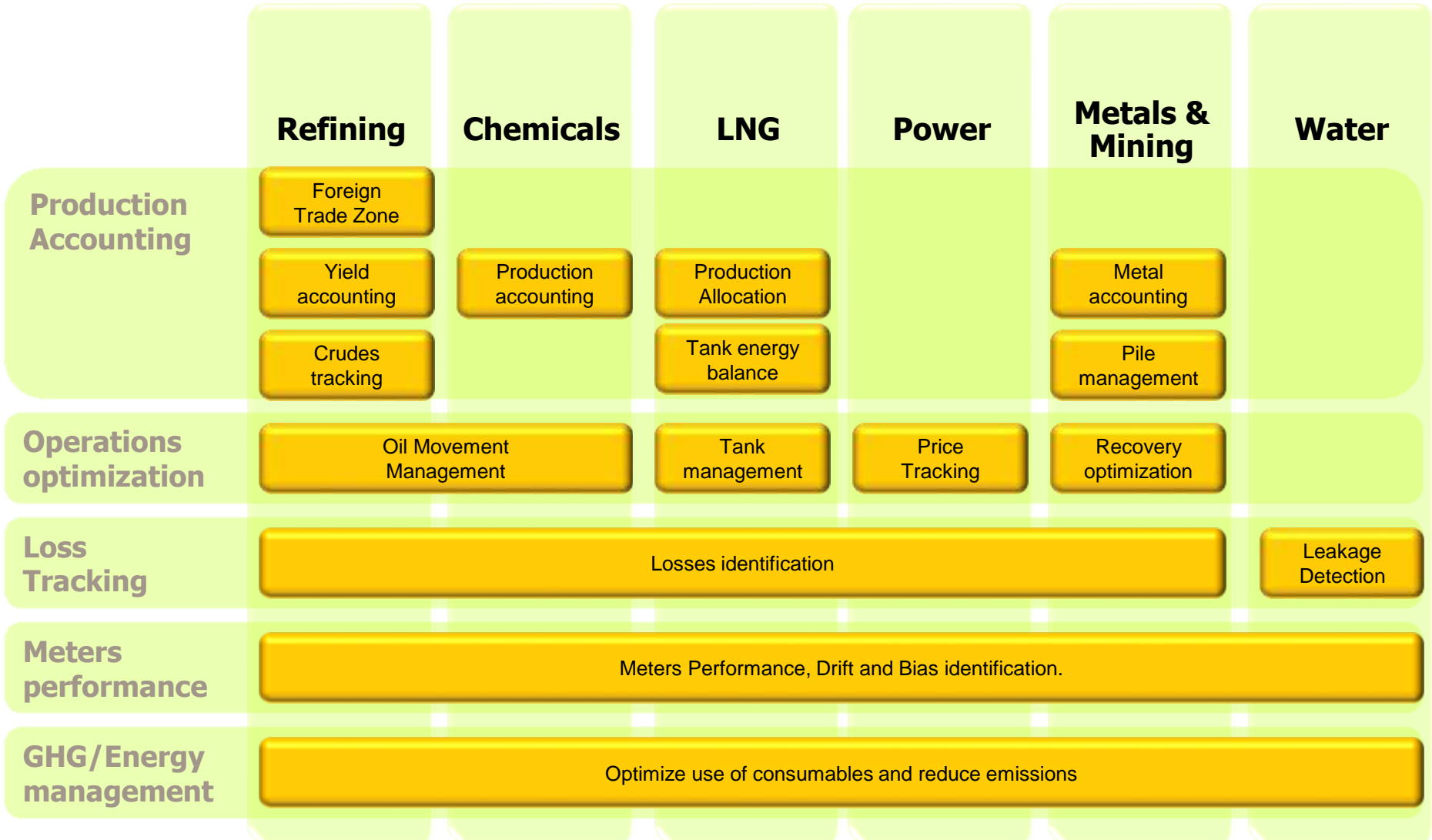
Sigmafine Evolution

Areas where Sigmafine is used

- Production accounting
- Plant-wide material balances
- Individual process units material balances
- Detection of measurement errors
- Meter maintenance administration
- Non-measured flows calculation
- Material losses accounting
- Component balances in gas plants
- Impurities tracking (*i.e.*, % sulfur)
- Heat exchanger energy balances

Sigmafine Evolution - Industries

Sigmafine Applications value map

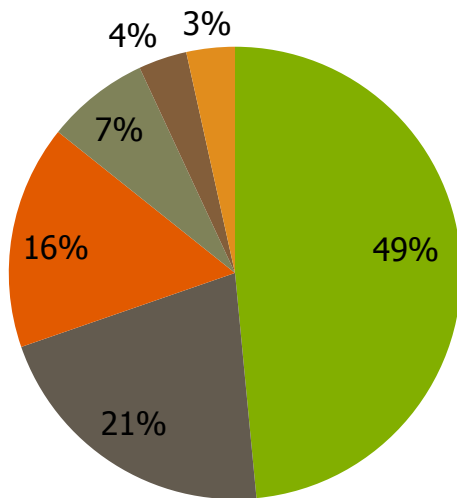


Sigmafine Evolution - By Market and Territory

A multi-industry solution

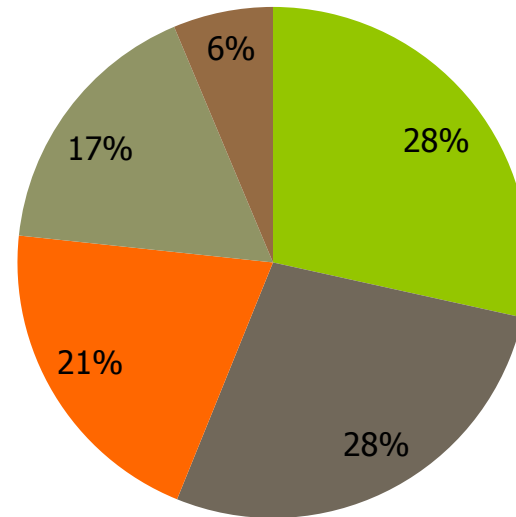
Industries

- Refining
- Chemicals
- Midstream & Upstream
- Metals & Mining
- Others
- Power



Territories

- North America
- Europe & Russia
- Asia & Pacific
- Latin America
- Middle East & Africa



About Us

Who is Pimsoft?

- We are a solution provider, bringing together software development and implementation expertise
- We deliver added value to our customers by providing complete Sigmafine-based solutions and consulting
- We consolidate and enhance the value-added network of customers and VARs worldwide, sharing best practices and knowledge to guarantee successful implementations

Who are some of our Customers?

- Chevron
- Ecopetrol
- Petrobras
- Pemex
- Tesoro
- Phillips66
- Flint Hills
- Hunt Refining
- Superior Refinery
- ORLEN
- Bapco
- Sasol
- PetroPeru
- ENI
- Suncor
- **Dow Corning**
- CountryMark
- ParaChem
- PetroChina

About Us

Pimsoft Service Offering

Sigmafine Tech Support

- 24/7 support from our offices in Europe and the USA

Field Services

- Sigmafine software installation and upgrades

Training

- Tailored training at customer premises
- Scheduled training at Visiant Pimsoft offices

Coaching

- Technical expertise to assist the Sigmafine users

Auditing

- Model assesment
- Model tuning

Consulting

- Feasibility Studies
- Project Planning
- Functional Design Specification

About Us

Pimsoft Service Offering continued...

Complete Project implementations

- Project Plan
- FDS
- Model Development and Systems Integration
- FAT
- Model and Integration Testing
- SAT
- Rollout

Sigmafine 3 to 4 migrations

- Model conversion
- System integration
- Report development

Application Management

- User support for the complete software solution
- Corrective maintenance
- Application enhancements

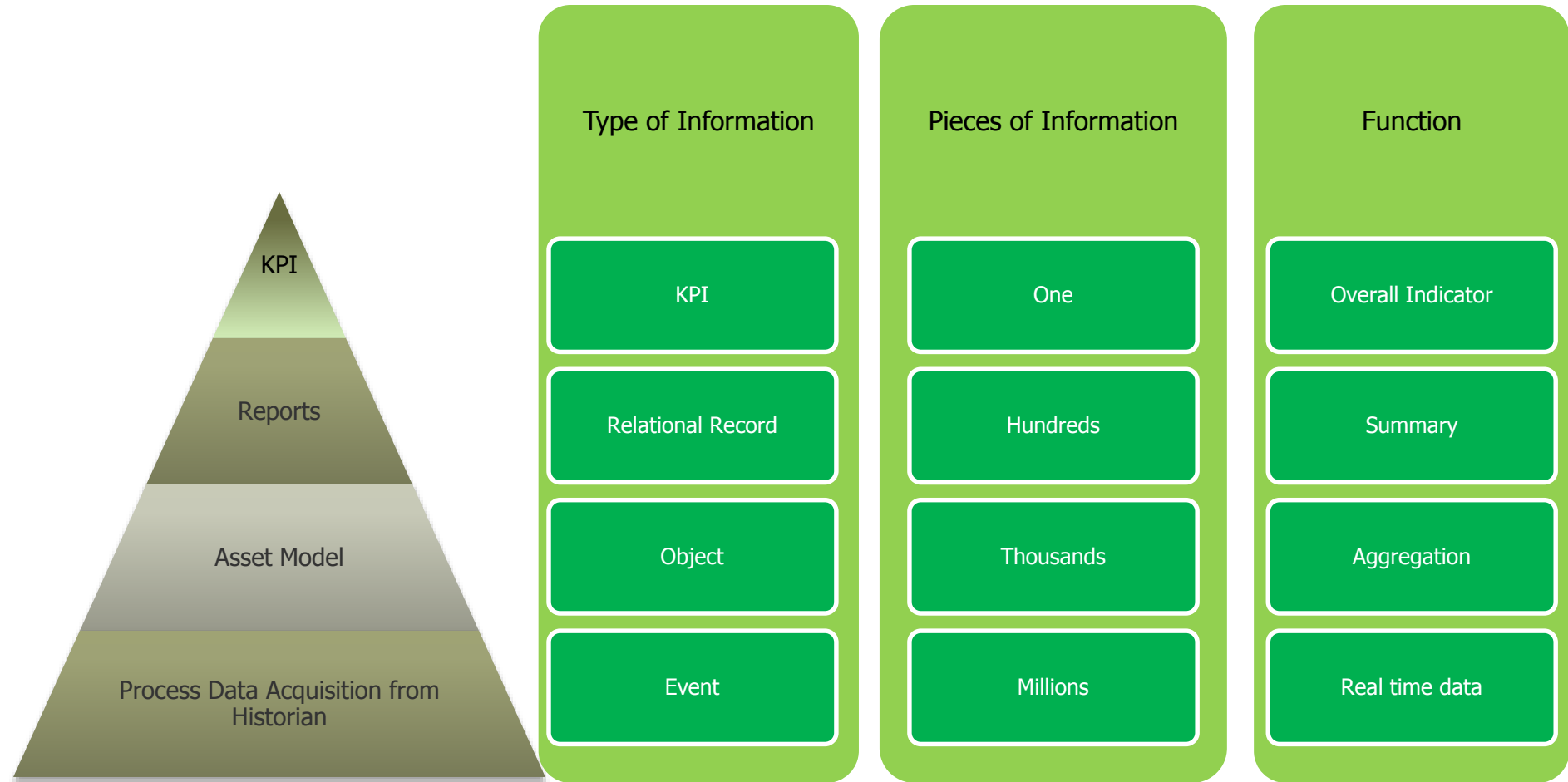
Sigmafine Benefits

Sigmafine Based Solutions

- Increasing Confidence of Production Information
 - Calculate Accurate Margins
- Sigmafine Projects have a good ROI
 - Monitoring and Controlling Loss
 - Enabling Process Optimization
 - Optimizing Energy Use
- Closing the Information Gap - Process and Business Data
 - Integrating with real time data (e.g., PI System)
 - Exposing data to business systems (e.g., SAP)
- Share the same information
 - Accountants
 - Engineers
 - Planners
 - Managers
- Adaptation to Process Configuration
- Adaptive from a Stand-alone to an Enterprise Solution

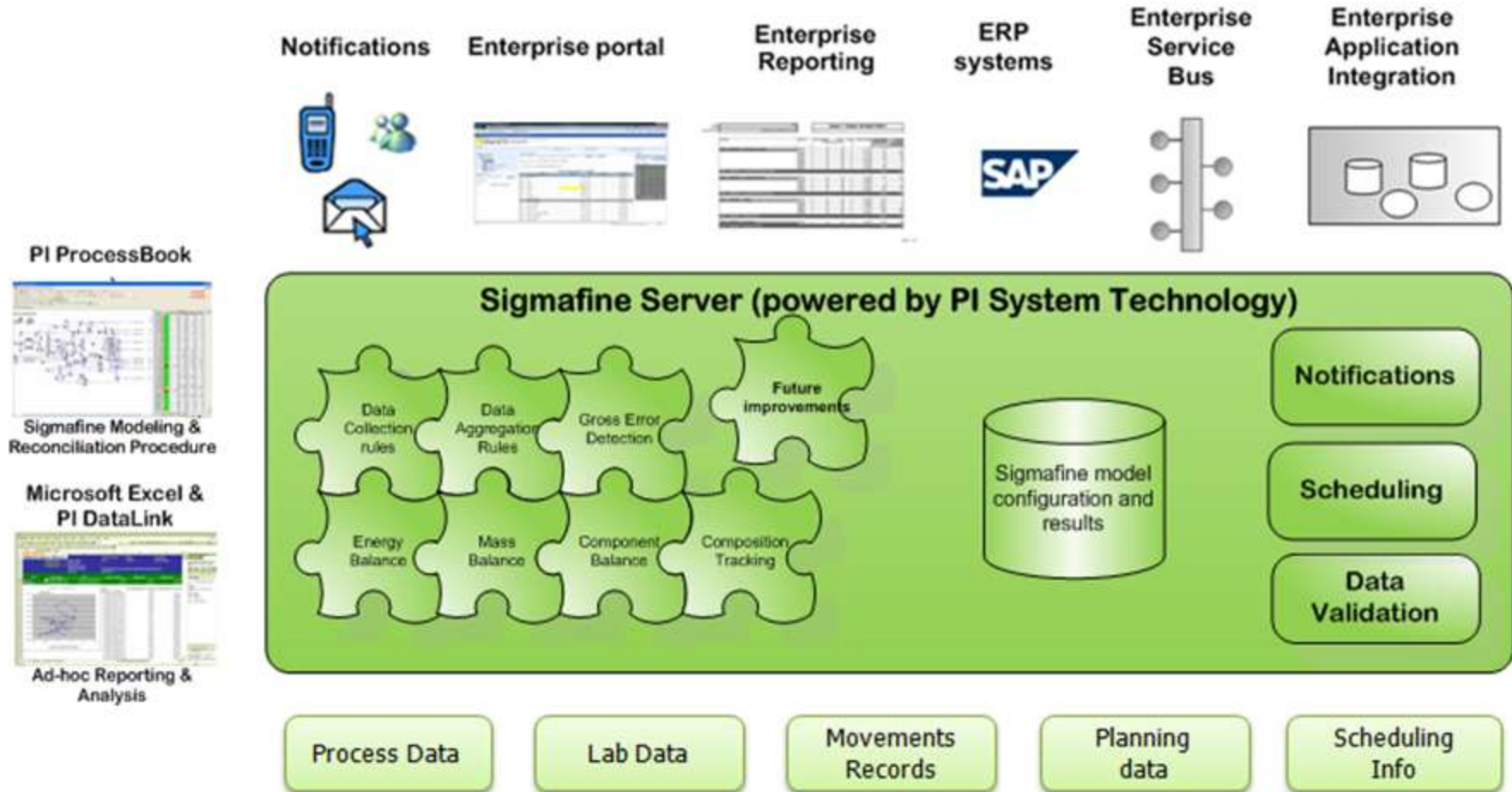
Sigmafine Benefits

Closing the Information Gap



Sigmafine Solution

Process and Business - Closing the Information Gap



Integration with Standard Reporting Technologies

Sigmafine SQL Access

The screenshot displays a web browser window with two overlapping reports. The background report is a 'Production Report' for the period 5/4/2007 4:00:00 AM to 5/4/2007 12:00:00. The foreground report is a 'Receipt and Shipment Report' for the period 2/22/2008 12:00:00 AM to 2/23/2008 12:00:00 AM.

Production Report Data:

Material	Tank Name	Opening Inventory lb	Receipts lb
ALK		6936345.12	0.00
ANS		67527889.05	36660099.00
BRF		0.00	14257800.00
CA		12346411.42	0.00
	Shp_5		0.00
	T208UT	80191.49	0.00
	T208UT	40191.34	0.00
	T208UT	40191.34	0.00
DIESEL		27712339.85	0.00
JET		7347555.81	0.00
LowSulfurFuelOil		26902665.60	0.00

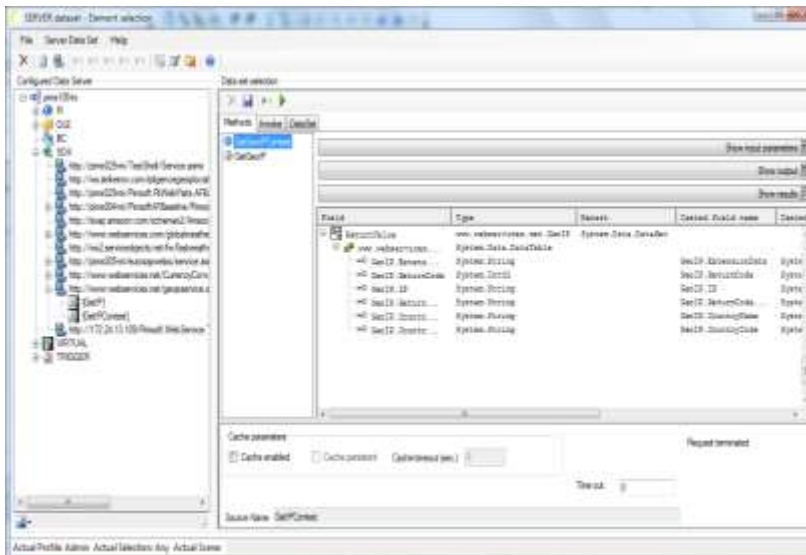
Receipt and Shipment Report Data:

Material	Transfer Name	Receipt Volume	Receipt Mass	Density	Shipment Volume	Shipment Mass
Material - A	TR20080222-001	10,000.00	16,000.00	0.00	0.00	0.00
	TR20080222-003	1,500.00	1,000.00	0.00	0.00	0.00
	TR20080222-002	1,000.00	1,000.00	0.00	0.00	0.00
Totals for Material A =		12,000.00	12,000.00		0.00	0.00
Material - B	TR20080222-008	0.00	0.00	0.00	3,434.00	123,124.00
	TR20080222-004	1,434.00	2,534.00	0.00	0.00	0.00
	TR20080222-006	0.00	0.00	0.00	1,513.00	2,300.00
Totals for Material B =		1,434.00	2,534.00		4,959.00	127,624.00
Material - C	TR20080222-007	0.00	0.00	0.00	25,000.00	1,000.00
	TR20080222-009	0.00	0.00	0.00	2,000.00	1,000.00
Totals for Material C =		0.00	0.00		27,000.00	2,000.00
Material - D						

Integration Framework

Integration Framework Connectors

- *Pimsoft gives you an easy way to connect your Sigmafine infrastructure to any of your Enterprise Applications: collect and reference external data into your Sigmafine environment, synchronize assets, attributes, and movements, expose or push Sigmafine results to business systems.*
- Connectors
 - Sigmafine - Honeywell OMS
 - Sigmafine - Entessa VPS
 - Sigmafine - Maron OAS
 - Sigmafine - Invensys TIS
 - Sigmafine - Invensys OMM



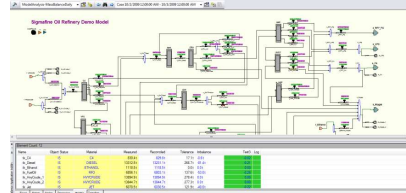
Sigmafine User Experience

Different views customized by user role

- IT Administrator



- Mass Balance User (Yield Accountant; Mass Balance Engineer)

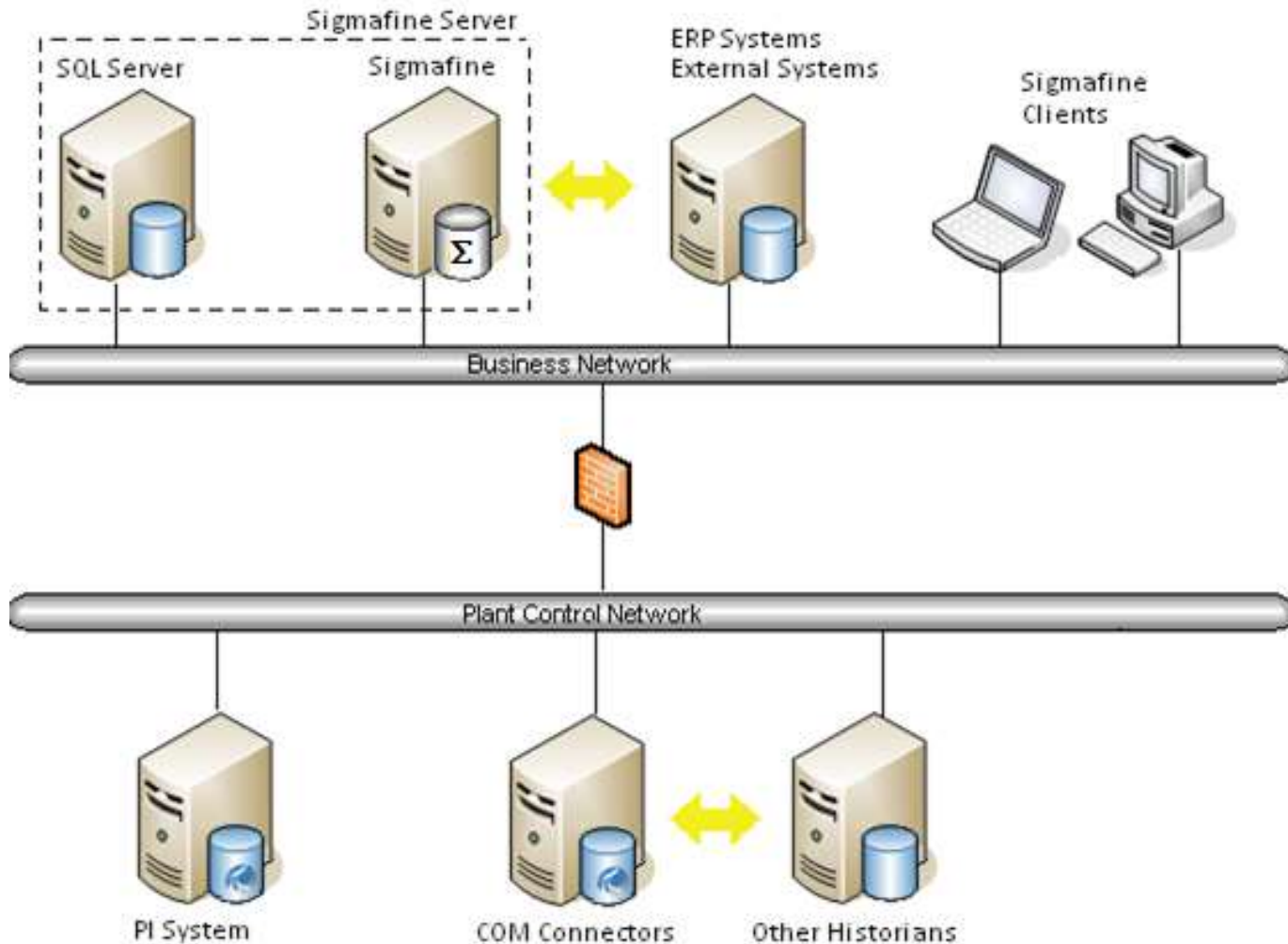


- Process Engineer

Unit Database for Chem						
10/17/2009 12:00:00 AM - 10/17/2009 12:00:00 AM						
Unit Code	Unit Name	Flow	Material	Stream In	Stream Out	Connector
BE Unit 101 (Open-Open)	C_PROD	B_CO2		101	102	101-102
BE Unit 102 (Open-Open)	C_PROD	B_CO2		102	103	102-103
BE Unit 103 (Open-Open)	C_PROD	B_CO2		103	104	103-104
BE Unit 104 (Open-Open)	C_PROD	B_CO2		104	105	104-105
BE Unit 105 (Open-Open)	C_PROD	B_CO2		105	106	105-106
BE Unit 106 (Open-Open)	C_PROD	B_CO2		106	107	106-107
BE Unit 107 (Open-Open)	C_PROD	B_CO2		107	108	107-108
BE Unit 108 (Open-Open)	C_PROD	B_CO2		108	109	108-109
BE Unit 109 (Open-Open)	C_PROD	B_CO2		109	110	109-110
BE Unit 110 (Open-Open)	C_PROD	B_CO2		110	111	110-111
BE Unit 111 (Open-Open)	C_PROD	B_CO2		111	112	111-112
BE Unit 112 (Open-Open)	C_PROD	B_CO2		112	113	112-113
BE Unit 113 (Open-Open)	C_PROD	B_CO2		113	114	113-114
BE Unit 114 (Open-Open)	C_PROD	B_CO2		114	115	114-115
BE Unit 115 (Open-Open)	C_PROD	B_CO2		115	116	115-116
BE Unit 116 (Open-Open)	C_PROD	B_CO2		116	117	116-117
BE Unit 117 (Open-Open)	C_PROD	B_CO2		117	118	117-118
BE Unit 118 (Open-Open)	C_PROD	B_CO2		118	119	118-119
BE Unit 119 (Open-Open)	C_PROD	B_CO2		119	120	119-120
BE Unit 120 (Open-Open)	C_PROD	B_CO2		120	121	120-121
BE Unit 121 (Open-Open)	C_PROD	B_CO2		121	122	121-122
BE Unit 122 (Open-Open)	C_PROD	B_CO2		122	123	122-123
BE Unit 123 (Open-Open)	C_PROD	B_CO2		123	124	123-124
BE Unit 124 (Open-Open)	C_PROD	B_CO2		124	125	124-125
BE Unit 125 (Open-Open)	C_PROD	B_CO2		125	126	125-126
BE Unit 126 (Open-Open)	C_PROD	B_CO2		126	127	126-127
BE Unit 127 (Open-Open)	C_PROD	B_CO2		127	128	127-128
BE Unit 128 (Open-Open)	C_PROD	B_CO2		128	129	128-129
BE Unit 129 (Open-Open)	C_PROD	B_CO2		129	130	129-130
BE Unit 130 (Open-Open)	C_PROD	B_CO2		130	131	130-131
BE Unit 131 (Open-Open)	C_PROD	B_CO2		131	132	131-132
BE Unit 132 (Open-Open)	C_PROD	B_CO2		132	133	132-133
BE Unit 133 (Open-Open)	C_PROD	B_CO2		133	134	133-134
BE Unit 134 (Open-Open)	C_PROD	B_CO2		134	135	134-135
BE Unit 135 (Open-Open)	C_PROD	B_CO2		135	136	135-136
BE Unit 136 (Open-Open)	C_PROD	B_CO2		136	137	136-137
BE Unit 137 (Open-Open)	C_PROD	B_CO2		137	138	137-138
BE Unit 138 (Open-Open)	C_PROD	B_CO2		138	139	138-139
BE Unit 139 (Open-Open)	C_PROD	B_CO2		139	140	139-140
BE Unit 140 (Open-Open)	C_PROD	B_CO2		140	141	140-141
BE Unit 141 (Open-Open)	C_PROD	B_CO2		141	142	141-142
BE Unit 142 (Open-Open)	C_PROD	B_CO2		142	143	142-143
BE Unit 143 (Open-Open)	C_PROD	B_CO2		143	144	143-144
BE Unit 144 (Open-Open)	C_PROD	B_CO2		144	145	144-145
BE Unit 145 (Open-Open)	C_PROD	B_CO2		145	146	145-146
BE Unit 146 (Open-Open)	C_PROD	B_CO2		146	147	146-147
BE Unit 147 (Open-Open)	C_PROD	B_CO2		147	148	147-148
BE Unit 148 (Open-Open)	C_PROD	B_CO2		148	149	148-149
BE Unit 149 (Open-Open)	C_PROD	B_CO2		149	150	149-150
BE Unit 150 (Open-Open)	C_PROD	B_CO2		150	151	150-151
BE Unit 151 (Open-Open)	C_PROD	B_CO2		151	152	151-152
BE Unit 152 (Open-Open)	C_PROD	B_CO2		152	153	152-153
BE Unit 153 (Open-Open)	C_PROD	B_CO2		153	154	153-154
BE Unit 154 (Open-Open)	C_PROD	B_CO2		154	155	154-155
BE Unit 155 (Open-Open)	C_PROD	B_CO2		155	156	155-156
BE Unit 156 (Open-Open)	C_PROD	B_CO2		156	157	156-157
BE Unit 157 (Open-Open)	C_PROD	B_CO2		157	158	157-158
BE Unit 158 (Open-Open)	C_PROD	B_CO2		158	159	158-159
BE Unit 159 (Open-Open)	C_PROD	B_CO2		159	160	159-160
BE Unit 160 (Open-Open)	C_PROD	B_CO2		160	161	160-161
BE Unit 161 (Open-Open)	C_PROD	B_CO2		161	162	161-162
BE Unit 162 (Open-Open)	C_PROD	B_CO2		162	163	162-163
BE Unit 163 (Open-Open)	C_PROD	B_CO2		163	164	163-164
BE Unit 164 (Open-Open)	C_PROD	B_CO2		164	165	164-165
BE Unit 165 (Open-Open)	C_PROD	B_CO2		165	166	165-166
BE Unit 166 (Open-Open)	C_PROD	B_CO2		166	167	166-167
BE Unit 167 (Open-Open)	C_PROD	B_CO2		167	168	167-168
BE Unit 168 (Open-Open)	C_PROD	B_CO2		168	169	168-169
BE Unit 169 (Open-Open)	C_PROD	B_CO2		169	170	169-170
BE Unit 170 (Open-Open)	C_PROD	B_CO2		170	171	170-171
BE Unit 171 (Open-Open)	C_PROD	B_CO2		171	172	171-172
BE Unit 172 (Open-Open)	C_PROD	B_CO2		172	173	172-173
BE Unit 173 (Open-Open)	C_PROD	B_CO2		173	174	173-174
BE Unit 174 (Open-Open)	C_PROD	B_CO2		174	175	174-175
BE Unit 175 (Open-Open)	C_PROD	B_CO2		175	176	175-176
BE Unit 176 (Open-Open)	C_PROD	B_CO2		176	177	176-177
BE Unit 177 (Open-Open)	C_PROD	B_CO2		177	178	177-178
BE Unit 178 (Open-Open)	C_PROD	B_CO2		178	179	178-179
BE Unit 179 (Open-Open)	C_PROD	B_CO2		179	180	179-180
BE Unit 180 (Open-Open)	C_PROD	B_CO2		180	181	180-181
BE Unit 181 (Open-Open)	C_PROD	B_CO2		181	182	181-182
BE Unit 182 (Open-Open)	C_PROD	B_CO2		182	183	182-183
BE Unit 183 (Open-Open)	C_PROD	B_CO2		183	184	183-184
BE Unit 184 (Open-Open)	C_PROD	B_CO2		184	185	184-185
BE Unit 185 (Open-Open)	C_PROD	B_CO2		185	186	185-186
BE Unit 186 (Open-Open)	C_PROD	B_CO2		186	187	186-187
BE Unit 187 (Open-Open)	C_PROD	B_CO2		187	188	187-188
BE Unit 188 (Open-Open)	C_PROD	B_CO2		188	189	188-189
BE Unit 189 (Open-Open)	C_PROD	B_CO2		189	190	189-190
BE Unit 190 (Open-Open)	C_PROD	B_CO2		190	191	190-191
BE Unit 191 (Open-Open)	C_PROD	B_CO2		191	192	191-192
BE Unit 192 (Open-Open)	C_PROD	B_CO2		192	193	192-193
BE Unit 193 (Open-Open)	C_PROD	B_CO2		193	194	193-194
BE Unit 194 (Open-Open)	C_PROD	B_CO2		194	195	194-195
BE Unit 195 (Open-Open)	C_PROD	B_CO2		195	196	195-196
BE Unit 196 (Open-Open)	C_PROD	B_CO2		196	197	196-197
BE Unit 197 (Open-Open)	C_PROD	B_CO2		197	198	197-198
BE Unit 198 (Open-Open)	C_PROD	B_CO2		198	199	198-199
BE Unit 199 (Open-Open)	C_PROD	B_CO2		199	200	199-200
BE Unit 200 (Open-Open)	C_PROD	B_CO2		200	201	200-201
BE Unit 201 (Open-Open)	C_PROD	B_CO2		201	202	201-202
BE Unit 202 (Open-Open)	C_PROD	B_CO2		202	203	202-203
BE Unit 203 (Open-Open)	C_PROD	B_CO2		203	204	203-204
BE Unit 204 (Open-Open)	C_PROD	B_CO2		204	205	204-205
BE Unit 205 (Open-Open)	C_PROD	B_CO2		205	206	205-206
BE Unit 206 (Open-Open)	C_PROD	B_CO2		206	207	206-207
BE Unit 207 (Open-Open)	C_PROD	B_CO2		207	208	207-208
BE Unit 208 (Open-Open)	C_PROD	B_CO2		208	209	208-209
BE Unit 209 (Open-Open)	C_PROD	B_CO2		209	210	209-210
BE Unit 210 (Open-Open)	C_PROD	B_CO2		210	211	210-211
BE Unit 211 (Open-Open)	C_PROD	B_CO2		211	212	211-212
BE Unit 212 (Open-Open)	C_PROD	B_CO2		212	213	212-213
BE Unit 213 (Open-Open)	C_PROD	B_CO2		213	214	213-214
BE Unit 214 (Open-Open)	C_PROD	B_CO2		214	215	214-215
BE Unit 215 (Open-Open)	C_PROD	B_CO2		215	216	215-216
BE Unit 216 (Open-Open)	C_PROD	B_CO2		216	217	216-217
BE Unit 217 (Open-Open)	C_PROD	B_CO2		217	218	217-218
BE Unit 218 (Open-Open)	C_PROD	B_CO2		218	219	218-219
BE Unit 219 (Open-Open)	C_PROD	B_CO2		219	220	219-220
BE Unit 220 (Open-Open)	C_PROD	B_CO2		220	221	220-221
BE Unit 221 (Open-Open)	C_PROD	B_CO2		221	222	221-222
BE Unit 222 (Open-Open)	C_PROD	B_CO2		222	223	222-223
BE Unit 223 (Open-Open)	C_PROD	B_CO2		223	224	223-224
BE Unit 224 (Open-Open)	C_PROD	B_CO2		224	225	224-225
BE Unit 225 (Open-Open)	C_PROD	B_CO2		225	226	225-226
BE Unit 226 (Open-Open)	C_PROD	B_CO2		226	227	226-227
BE Unit 227 (Open-Open)	C_PROD	B_CO2		227	228	227-228
BE Unit 228 (Open-Open)	C_PROD	B_CO2		228	229	228-229
BE Unit 229 (Open-Open)	C_PROD	B_CO2		229	230	229-230
BE Unit 230 (Open-Open)	C_PROD	B_CO2		230	231	230-231
BE Unit 231 (Open-Open)	C_PROD	B_CO2		231	232	231-232
BE Unit 232 (Open-Open)	C_PROD	B_CO2		232	233	232-233
BE Unit 233 (Open-Open)	C_PROD	B_CO2		233	234	233-234
BE Unit 234 (Open-Open)	C_PROD	B_CO2		234	235	234-235
BE Unit 235 (Open-Open)	C_PROD	B_CO2		235	236	235-236
BE Unit 236 (Open-Open)	C_PROD	B_CO2		236	237	236-237
BE Unit 237 (Open-Open)	C_PROD	B_CO2		237	238	237-238
BE Unit 238 (Open-Open)	C_PROD	B_CO2		238	239	238-239
BE Unit 239 (Open-Open)	C_PROD	B_CO2		239	240	239-240
BE Unit 240 (Open-Open)	C_PROD	B_CO2		240	241	240-241
BE Unit 241 (Open-Open)	C_PROD	B_CO2		241	242	241-242
BE Unit 242 (Open-Open)	C_PROD	B_CO2		242	243	242-243
BE Unit 243 (Open-Open)	C_PROD	B_CO2		243	244	243-244
BE Unit 244 (Open-Open)	C_PROD	B_CO2		244	245	244-245
BE Unit 245 (Open-Open)	C_PROD	B_CO2		245	246	245-246
BE Unit 246 (Open-Open)	C_PROD	B_CO2		246	247	246-247
BE Unit 247 (Open-Open)	C_PROD	B_CO2		247	248	247-248
BE Unit 248 (Open-Open)	C_PROD	B_CO2		248	249	248-249
BE Unit 249 (Open-Open)	C_PROD	B_CO2		249	250	249-250
BE Unit 250 (Open-Open)	C_PROD	B_CO2		250	251	250-251
BE Unit 251 (Open-Open)	C_PROD	B_CO2		251	252	251-252
BE Unit 252 (Open-Open)	C_PROD	B_CO2		252	253	252-253
BE Unit 253 (Open-Open)	C_PROD	B_CO2		253	254	253-254
BE Unit 254 (Open-Open)	C_PROD	B_CO2		254	255	254-255
BE Unit 255 (Open-Open)	C_PROD	B_CO2		255	256	255-256
BE Unit 256 (Open-Open)	C_PROD	B_CO2		256	257	256-257
BE Unit 257 (Open-Open)	C_PROD	B_CO2		257	258	257-258
BE Unit 258 (Open-Open)	C_PROD	B_CO2		258	259	258-259
BE Unit 259 (Open-Open)	C_PROD	B_CO2		259	260	259-260
BE Unit 260 (Open-Open)	C_PROD	B_CO2		260	261	260-261
BE Unit 261 (Open-Open)	C_PROD	B_CO2		261	262	261-262
BE Unit 262 (Open-Open)	C_PROD	B_CO2		262	263	262-263
BE Unit 263 (Open-Open)	C_PROD	B_CO2		263	264	263-264
BE Unit 264 (Open-Open)	C_PROD	B_CO2		264	265	264-265
BE Unit 265 (Open-Open)	C_PROD	B_CO2		265	266	265-266
BE Unit 266 (Open-Open)	C_PROD	B_CO2		266	267	266-267
BE Unit 267 (Open-Open)	C_PROD	B_CO2		267	268	267-268
BE Unit 268 (Open-Open)	C_PROD	B_CO2		268	269	268-269
BE Unit 269 (Open-Open)	C_PROD	B_CO2		269	270	269-270
BE Unit 270 (Open-Open)	C_PROD	B_CO2		270	271	270-271
BE Unit 271 (Open-Open)	C_PROD	B_CO2		271	272	271-272
BE Unit 272 (Open-Open)	C_PROD	B_CO2		272	273	272-273
BE Unit 273 (Open-Open)	C_PROD	B_CO2		273	274	273-274
BE Unit 274 (Open-Open)	C_PROD	B_CO2		274	275	274-275
BE Unit 275 (Open-Open)	C_PROD	B_CO2		275	276	275-276
BE Unit 276 (Open-Open)	C_PROD	B_CO2		276	277	276-277
BE Unit 277 (Open-Open)	C_PROD	B_CO2		277	278	277-278
BE Unit 278 (Open-Open)	C_PROD	B_CO2		278	279	278-279
BE Unit 279 (Open-Open)	C_PROD	B_CO2		279	280	279-280
BE Unit 280 (Open-Open)	C_PROD	B_CO2		280	281	280-281
BE Unit 281 (Open-Open)	C_PROD	B_CO2		281	282	281-282
BE Unit 282 (Open-Open)	C_PROD	B_CO2		282	283	282-283
BE Unit 283 (Open-Open)	C_PROD	B_CO2		283	284	283-284
BE Unit 284 (Open-Open)	C_PROD	B_CO2		284	285	284-285
BE Unit 285 (Open-Open)	C_PROD	B_CO2		285	286	285-286
BE Unit 286 (Open-Open)	C_PROD					

Sigmafine Architecture

General Description

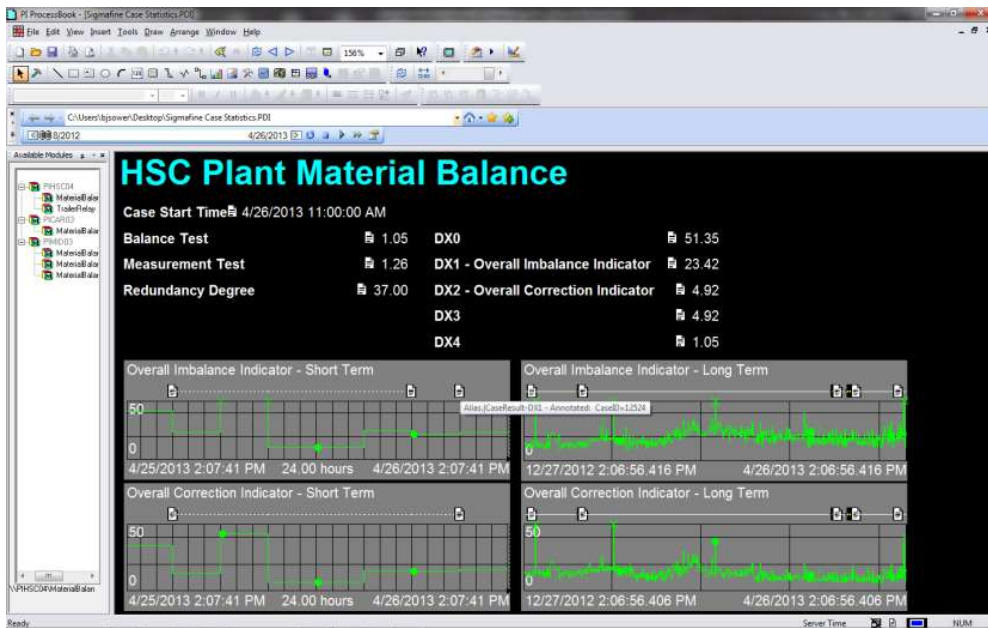


Demonstration

=

=

=



Questions?

	Refining	Chemicals	LNG	Power	Metals & Mining	Water
Production Accounting	Foreign Trade Zone Yield accounting Crudes tracking	Production accounting	Production Allocation Tank energy balance		Metal accounting Pile management	
Operations optimization	Oil Movement Management		Tank management	Price Tracking	Recovery optimization	
Loss Tracking	Losses Identification					Leakage Detection
Meters performance	Meters Performance, Drift and Bias Identification.					
GHG/Energy management	Optimize use of consumables and reduce emissions					

PiMSOFT
 INNOVATIVE SOLUTIONS

Conclusion

The implementation of Sigmafine to perform automated accounting mass balances provides Dow Corning with globally standard tools and has enabled them to improve the timeliness and accuracy of their physical versus SAP inventory. They have some balances that will execute 300+ transactions every 3 hours and notifies immediately of any inventory discrepancies. *This is key to insuring timely deliveries to customers and minimizing cost associated with artificially high safety stock inventory levels.*

DOW CORNING

We help you invent the future.™

Contacts – Follow up

Have a production accounting, data reconciliation, or mass balance need?

- **Bryan Sower- PI Technology Steward**

Dow Corning

Email: bryan.sower@dowcorning.com

- **Roberto Linares – Vice President**

Pimsoft

Office: +1(281) 920 9196 Ext. 1001

Email: roberto.linares@pimsoftinc.com

sigmafine.info@pimsoftinc.com



For OSIssoft questions please contact your representative or

- **Erika Ferguson - Partner Manager**

OSIssoft

Mobile: (510) 604- 9053

Email: eferguson@osisoft.com

OSIsoft Partner Solution Showcase

- Find software solutions from OSIsoft partners with specific industry and domain expertise.
- <http://partners.osisoft.com/solutions>
- pss@osisoft.com

The screenshot displays the OSIsoft Partner Solution Showcase website. The header features the OSIsoft logo and the text 'partner solution showcase' on the left, and 'Sign In | Register' on the right. A search bar is located in the top right corner. Below the header is a navigation menu with links for 'Home', 'Browse All Solutions', 'Solution Directory', 'News & Announcements', and 'FAQ'. The main content area shows search results for 'sigmafine'. On the left, there is a 'Refine Search' sidebar with a search input field containing 'sigmafine' and several filter categories: 'Implementation Time', 'Industry' (with sub-options: Chemical & Petrochemicals (1), Materials, Mines, Metals & Metallurgy (1), Oil & Gas (1), Power & Utilities (1)), 'Region', and 'Solution Area'. The main results area shows '1 Result' with a 'Sort by Relevance' dropdown and pagination controls. The result is for 'Sigmafine', described as an open, configurable platform for modeling plants and processes. It is attributed to 'Pimsoft Inc' and dated 'April, 10, 2012', with a star rating of 0. A logo for Sigmafine is also visible.

Next Webinar – May 15

Title:

Umetrics SIMCA-online: Complex Analytics Applied to PI System™ Data

Content:

Umetrics' SIMCA product family incorporates PI System™ data and events to provide both off-line and on-line multivariable analysis for continuous and batch processes.



Thank you

© Copyright 2012 OSIsoft, LLC.
777 Davis St., San Leandro, CA 94577

Demonstration

=

=

=

Solutions Demonstration

- The Sigmafine add-in to Excel allows the user to configure report templates or ad-hoc reports to display Sigmafine Analysis results. In this example tank inventories are displayed

	bbl						klb						InitInb
	Measured			Reconciled			Measured			Reconciled			
	Close	Open	Delta (C-O)	Close	Open	Delta (C-O)	Close	Open	Delta (C-O)	Close	Open	Delta (C-O)	
Total	898,706	898,994	-289	898,909	898,994	-85	261,142	261,210	-67	261,214	261,210	4	72
Raw Materials	401,217	400,658	559	0	400,658	-400,658	121,937	121,772	165	122,490	121,772	718	553
Other	497,489	498,336	-847	898,909	498,336	400,573	139,205	139,437	-232	138,723	139,437	-714	-482
Tank													
tk_C4	9,014	8,997	17	8,974	8,997	-23	1,843	1,840	4	1,835	1,840	-5	-8
tk_Diesel	97,891	97,574	316	97,088	97,574	-487	29,307	29,213	95	29,067	29,213	-146	-240
tk_Ethanol	9,034	9,027	7	9,034	9,027	7	2,467	2,466	2	2,468	2,466	2	0
tk_FuelOil	47,848	47,913	-65	48,092	47,913	179	15,045	15,066	-20	15,122	15,066	56	77
tk_GasOil	49,766	50,092	-326	48,740	50,092	-1,352	14,986	15,085	-98	14,677	15,085	-407	-309
tk_HvyCrude_1	97,675	98,166	-492	98,135	98,166	-31	30,440	30,593	-153	30,583	30,593	-10	144
tk_HvyCrude_2	98,086	97,682	404	98,550	97,682	868	30,568	30,442	126	30,712	30,442	270	145
tk_Jet	48,114	48,040	75	47,904	48,040	-136	13,478	13,457	21	13,419	13,457	-38	-59
tk_LPG	9,044	9,024	21	9,032	9,024	8	1,650	1,646	4	1,648	1,646	1	-2
tk_LtCrude_1	98,424	97,633	791	98,871	97,633	1,237	29,295	29,059	235	29,427	29,059	368	133
tk_LtCrude_2	97,999	98,149	-150	98,441	98,149	292	29,168	29,213	-45	29,300	29,213	87	132
tk_Mogas_1	97,640	98,149	-509	98,106	98,149	-43	25,984	26,120	-136	26,108	26,120	-11	124
tk_Mogas_2	98,281	98,431	-150	98,754	98,431	322	26,155	26,195	-40	26,281	26,195	86	126
tk_Naphtha	39,891	40,117	-226	39,190	40,117	-927	10,756	10,816	-61	10,566	10,816	-250	-189

Solutions Demonstration

Sigmafine Excel Add-in – Sample Unit Balance Report

Unit Balances for Case					
10/1/2009 12:00:00 AM - 10/2/2009 12:00:00 AM					
Refinery					
Unit Code	N/A		Mass, klb		
Flow	From	To	Measured	Reconciled	Correction
RM Delta Inv (Open-Close)			528	528	0
f_PCCUF	r_PCCF	p_CCU	0	0	0
Receipts			30789	0	-30789
Total In			31318	528	
Prod&ProcStks Delta Inv (Close-Open)			-171	384	555
f_RFY_FG	n_RFY_FG	s_RFY_FG	2412	2378	-34
f_CCU_Coke	p_CCU	s_CCU_Coke	540	539	0
f_COK_Coke	p_COKER	s_Coker_Coke	1714	1709	-5
Shipments			26201	0	-26201
Total Out			30695	5010	
<i>Imbalance (In-Out)</i>			<i>622</i>	<i>-4482</i>	
			<i>1.99%</i>		
Light Crude					
Unit Code	n_LtCrude		Mass, klb		
Flow	From / To	Meter	Measured	Reconciled	Correction
TR20091001-LtCrude			14894	0	-14894
Total In			14894	0	
f_LtCrudetocu	n_CU_Charge	No Attachments	14738	14738	0

Solution Demonstration (Advanced Analysis)

Component Analysis example for accounting in metals and mining

The screenshot displays the PI ProcessBook interface for a Grinding and Flotation Plant. The main window shows a process flow diagram with components such as Primary Grinder, Primary Cyclones, Secondary Cyclones, Secondary Grinder, Flash Float Rougher, Flash Float Cleaner, and Tertiary Cyclones. The diagram is titled "Grinding and Flotation Plant".

On the left side, there is an AF Browser and AF Property panel. The AF Property panel shows the following data:

Meter	Obj...	MeasuredMass	MassTolerance	Correction	Test1	L
m-Cleaner Co...	IS	63.2665440000...	0.63266544000...	8.2305E-07	0	
m-Cleaner Sc...	IS	45.0643680000...	0.45064368000...	-9.61E-09	0	
m-Cleaner Sc...	IS	25.4949120000...	0.25494912000...	-3.65E-09	0	
m-Cleaner Sc...	IS	13.850928	0.13850928	-1.2E-09	0	
m-Cleaner Sc...	IS	0.0000000000	0.0000000000	0.0000000000	0	

At the bottom right, a "Data Table Edit" window is open, showing the following data:

Component Name	Value	Tolerance	Maximum
Au	3.1E-07	1.55E-08	1
Cu	0.0034	6.8E-05	1
Fe	0.016	0.00048	1
S	0.0125	0.00025	1
SiO2	0.657	0.01314	1

Solution Demonstration

Calculations configured with standard AF and Pimsoft plug-ins

- Calculations are handled easily by Sigmafine with the use of data references.

WVMWINXPSP210il Refinery Demo - PI System Explorer

File Edit View Go Tools Help

Database Query Date Back Check In Refresh New Element New Attribute Search

Elements

- Elements
 - <None>
 - SF_AnalyzerTemplate
 - SF_CaseResultsTemplate
 - SF_FlowTemplate
 - SF_GasMeterTemplate
 - m_CCU_OVHD
 - m_COK_OVHD**
 - m_CRU_H2
 - m_CRU_H2_CFH
 - m_CRU_H2_DHT
 - m_CRU_H2_NHT
 - m_CRU_OVHD

Elements

Event Frames

Library

Unit of Measure

Model Analyses

22 Attributes

m_COK_OVHD

General Child Elements Attributes Ports Version

Group by: Category Template

Filter

Name	Value	Data Reference
i2_GasFlowEntry-ActualConditio...	7122.03252476711 k acf	Formula
i2_GasFlowTypical	7300 k acf	<None>
i3_MW	40 lb/lbmol	Table Looku
i3_NHV	2080 Btu/scf	Formula
i3_Press	14.73 psia	<None>
i3_Temp	60 °F	<None>
i3_Z	1	<None>
i4_Meas_Volume	7159.393323 k scf	UOM
i4_Meas_Volume_FOE	2533.6420895654 FOE-bbl	UOM
i5_Meas_Mass	776.771526719496 klb	UOM

Solution Demonstration

Crude Tank Composition Tracking

- Example of a model configured for crude tank composition tracking using the *Composition Tracking Analysis Rule*