

Sigmafine Reconciliation Tool Implementation in Slovnaft Refinery

**Linking operational data to business activities enables
collaboration & increases profits**

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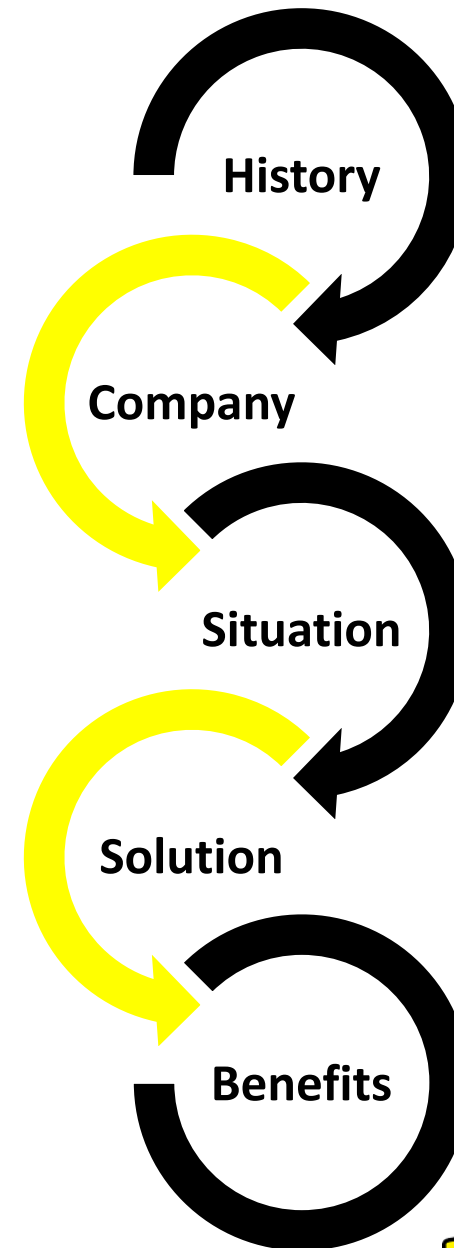
Presented at the European Petrochemical & Refining Congress, Hamburg, DE – May 22nd – 23rd 2017

1. Introduction



Introduction

- Win the challenge of production accounting for a complex site
- Leverage data quality in terms of:
 - Data consistency
 - Data accessibility
 - Data auditability
- Integrate a complete data work flow from the field up to the enterprise level

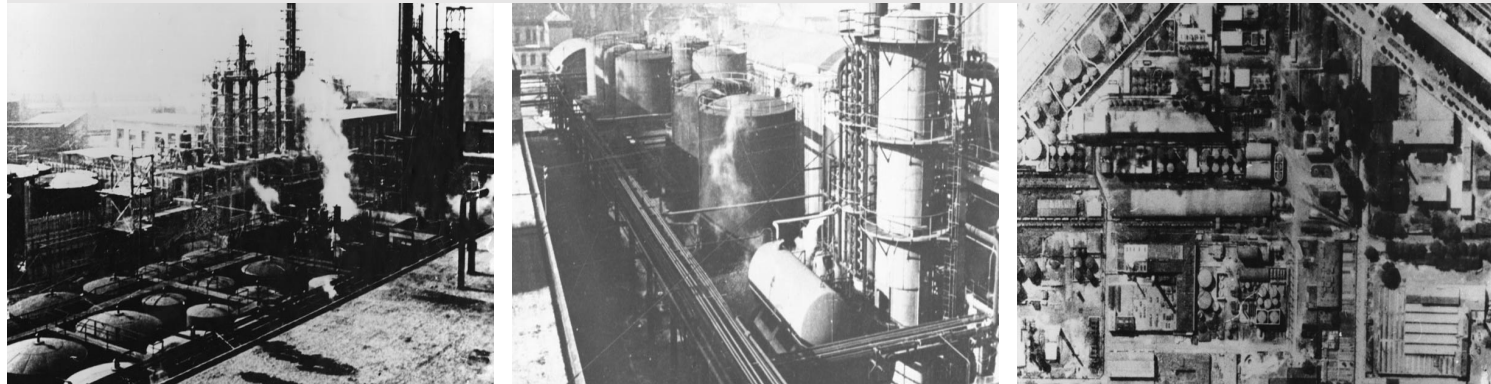


1. History



From the Past to the Present

Apollo Refinery 1895 – 1963 (Capacity 30- 40 kt)



Slovnaft Refinery 1957-present days (Current capacity 6100 kt)



Bratislava



Slovnaft Refinery

2. Company Overview

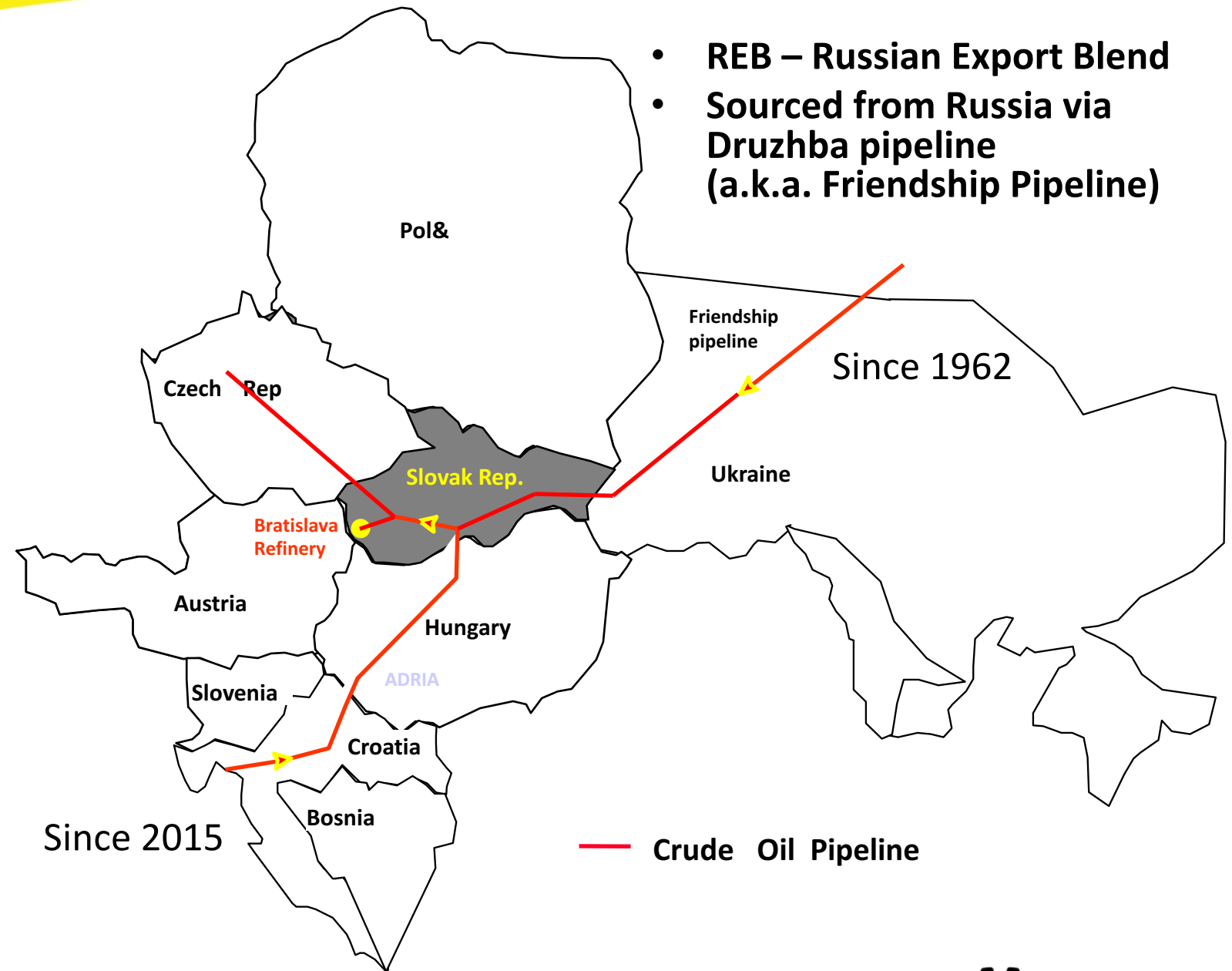




Member since 2000



Supply Situation

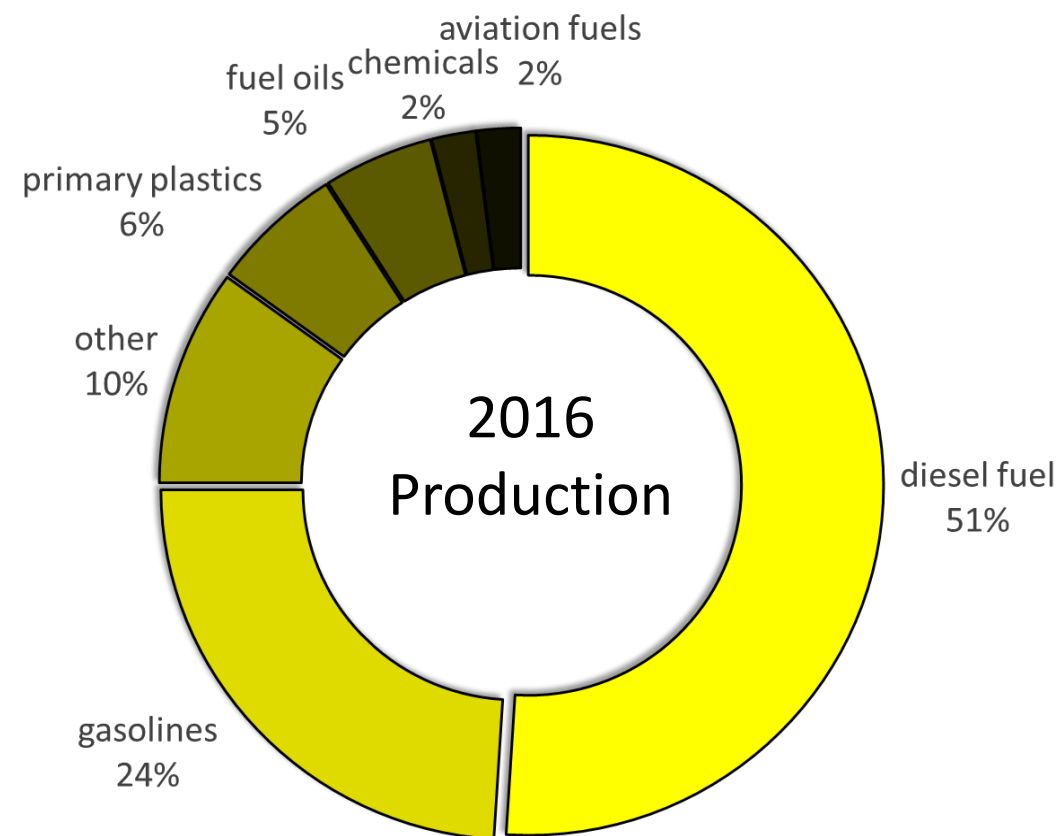
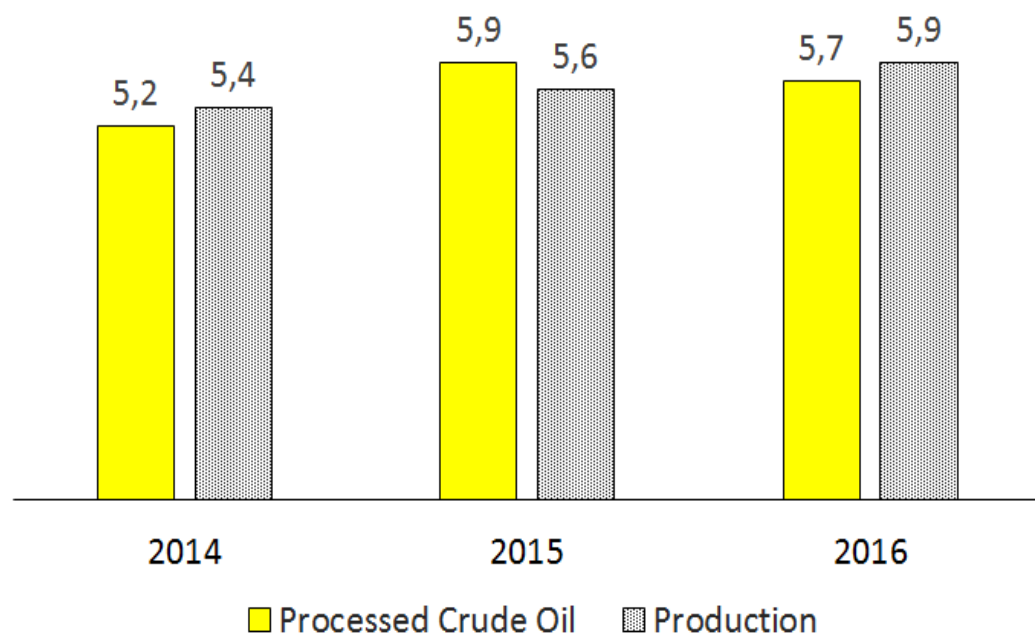


Facts & figures*



Nelson C.I.

11.4



3. Context & Situation





A 10 Year Journey...

- 2007: Start implementation of reconciliation the Group Solution
 - Use standard tool
 - Implementation in all sites of MOL Group
- Tried to implement 3 times unsuccessfully:
 - 2008: Did not fulfilled the identification of sources of losses
 - 2009-2012: Focus on DCS improvements (balancing calculation, loss management & reduction) distracted resources & prevented project completion
 - 2012-2014: further implementation not fulfilled:
 - Autumn 2012: Refinery & Petchem merged into SN Refinery, causing lack of internal Human Resources
 - May 2014: Project stops due to start of new ERP system, preventing work on integration
- Until this implementation it was not really a project, there were other priorities, not good planning and timing (collisions)

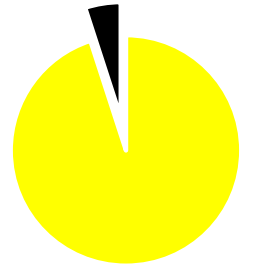
Existing Systems not aligned with the new business strategy

- Low performance in data entry & limited analysis capabilities
 - Only one person can do balancing at a given time
 - Lots of manual data entries, lot of verification daily
 - No diagnostic tool nor graphical visualisation
- Poor data quality
 - Constant properties (e.g. density) for product measurement
 - Inventory & losses are fixed
- Limited data accessibility
 - No direct connection with plant historian
 - Information available only in datasheets
 - No publishing via a Refinery Information System

4. Project & Solution



Production accounting is...

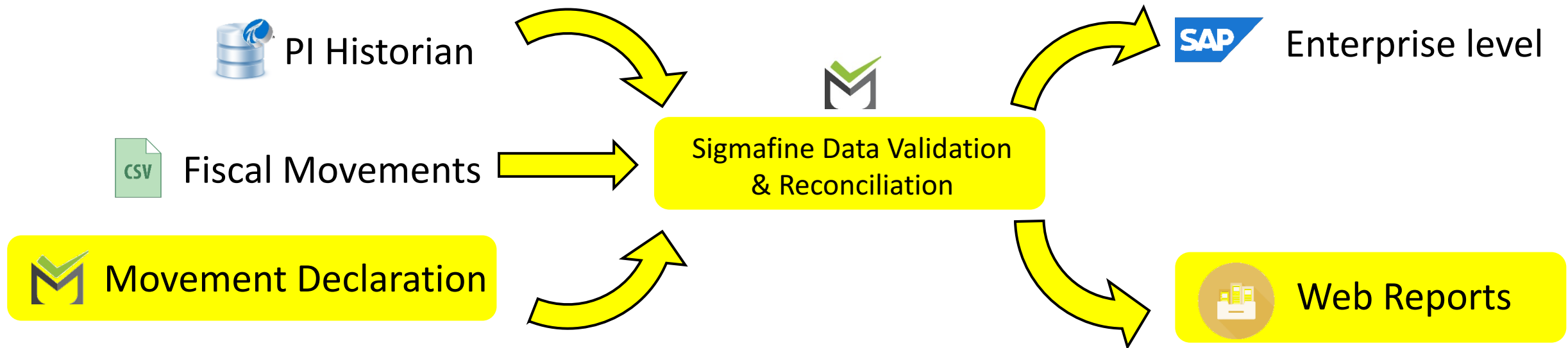


... the business process of ***measuring***, **validating** & **publishing** flows & inventories occurring **into**, **within** & **out** of the plant & the refinery

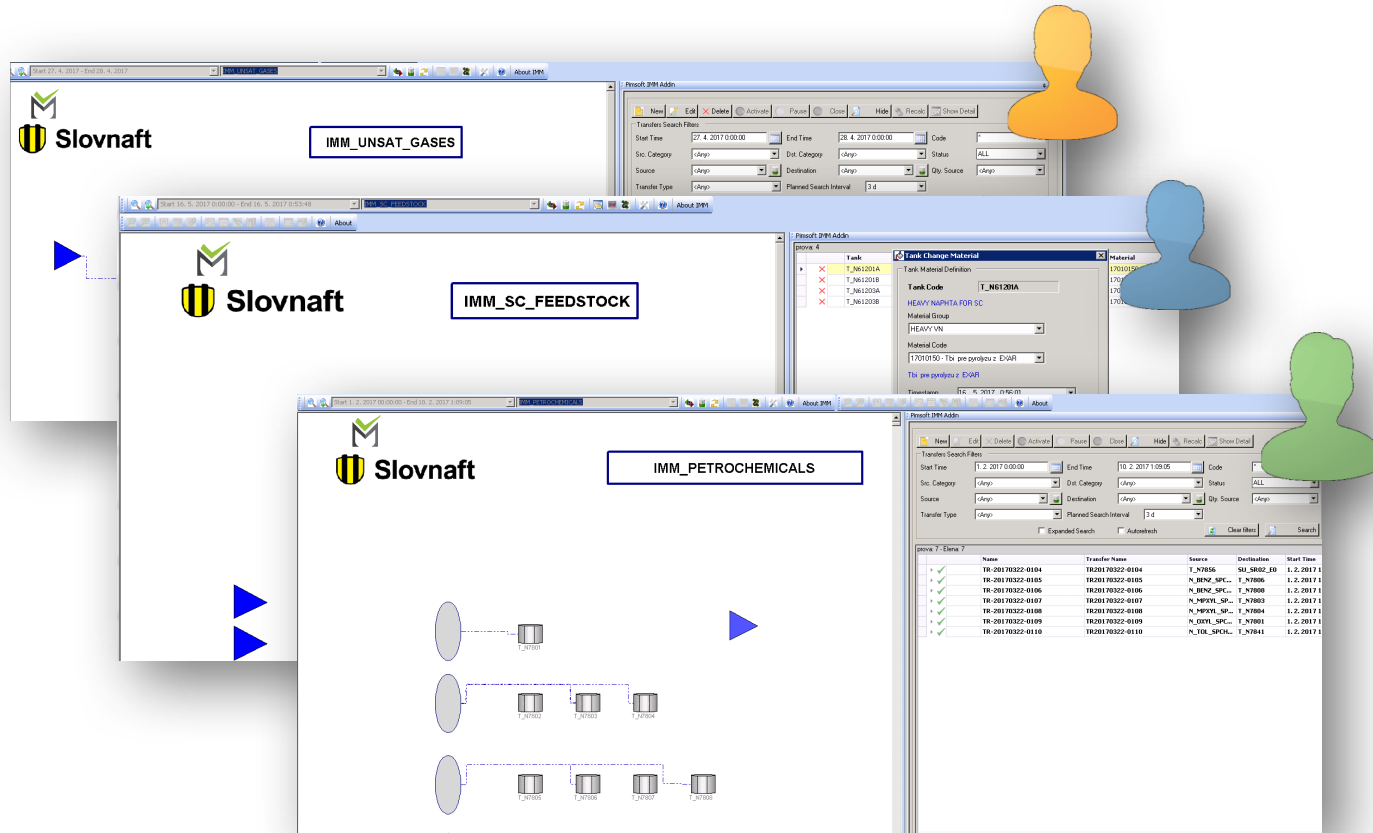
Project objective

Apply set of unified tools & practices to manage integrated operations based on relevant & timely information & in compliance with the MOL Group guidelines & integrated business processes

An integrated information work flow from process to enterprise level



Collaborative Accounting environment



50

Movement Operators

14

Plant Areas

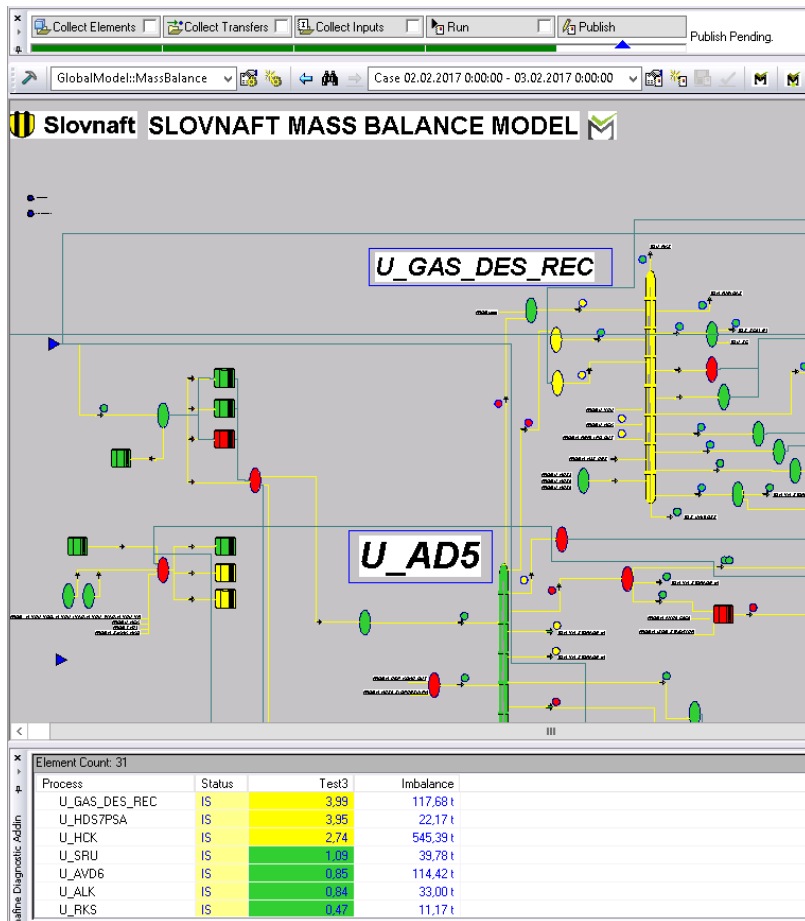
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Accountants

1

Environment

Empower accounting with data science

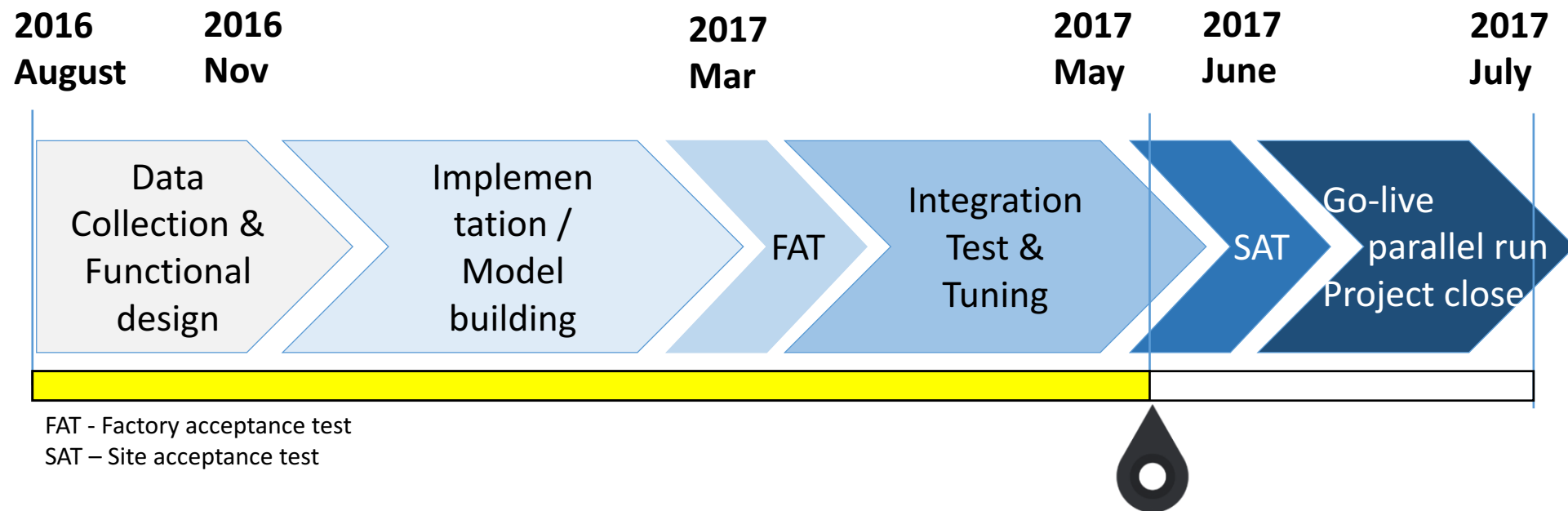


- Solvability analysis of the network
- Statistical tests associated to
 - Measurement correction
 - Imbalance correction
- Data quality indicators on
 - Measured data
 - Reconciled data
 - Overall model
- Accountant can focus on bad ranking units & worst meters

Turnkey solution for a successful implementation

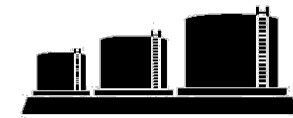
- Close team work between Slovnaft & Pimsoft
- Top management involvement from the very beginning
- Deep preliminary analysis done by Supplier to clearly identify scope & project risks
- Create a solution entirely based on product functionalities without custom development
- Transparency on information among teams & management

Project Timeline & Status

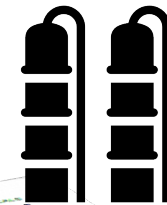


Implementation Challenges

- Complex, integrated refinery & petrochemical model
- Many intermediate & final product storage tanks
- Complex integration rules with ERP
- Many stakeholders
- Fit parallel project in MOL Petrochemicals
- Many end users for new IMM movement management



280



31



> 600

5. Results & Benefits



Results & Benefits

INITIAL GOAL

Dedicate more time to data analysis & improve accounting accuracy, reducing man hours spent for data entry



CHALLENGE

Make work of accountants & movement operators more efficient & coherent

SOLUTION



Provide a flexible solution that allows easy declaring of movements & full graphical interface & statistical diagnostics

Allow multiple users to connect & work at the same time through a client-server architecture

RESULTS



Reduction of manual inputs to be declared

Divide et impera approach allows splitting the work load by plant area for movement declaration still keeping one model for the entire complex

Accountant can detect more easily major discrepancies

Results & Benefits

INITIAL GOAL

Improve loss accounting



CHALLENGE

In former system, production units were modeled as fixed, calculated by planning standards, mainly as a portion of feed; process units and their losses were treated as separate «islands»

SOLUTION



Based on design & process knowledge, losses (flares, technical losses at unit level, stoichiometrical losses) have been integrated in one, fully connected, reconciliation model

RESULTS



Losses are now accounted with a better detail & visibility at unit level.

Future expectation is to reduce even further the uncertainty in loss accounting

Results & Benefits

INITIAL GOAL

Data visible at different company levels, with full control of the work flow



CHALLENGE

Many different data source & data consumers need to be part of the same picture & not segregated in separate boxes

SOLUTION



Sigmafine solution together with its movement management & Integration Framework allowed native connection to the historian, process fiscal movement, historicize reconciled solution, generate reports & ERP movements

RESULTS



All the production accounting work flow is now managed through one single product
Data are visible, accessible & auditable
There is no more segregation between process & enterprise levels

Conclusion



Meeting business strategy through a cooperative and data quality driven Production Accounting

- One unified environment to **control the full data flow**
- Improve **quality of data** (productions, consumptions and losses) reported to business
- **Cooperation of all the actors** (operators and accountants) to provide better inputs for the balance and **reduce human error** in data handling
- **Transparency** on data manipulation from the raw value to the official reported data
- **Scalability** of the solution to add / modify assets in the future according to changes in the plant and to **adapt to new business logic**

Fitting MOL Group 2030 Strategy

- Resilient Integrated Business Model

➡ Create an accounting solution flexible & scalable other time

- High-Quality / Low-cost Asset Base

➡ Leverage quality of already existing assets through a comprehensive model of refinery & petrochemical site

- Systematic efficiency

➡ Decrease the need of manual inputs & reduce human factor by implementing a single data workflow