OSIsoft® UC2010

Real Time Information — Currency of the New Decade

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OSIsoft PI
A Multi-Operations Platform for TIGF

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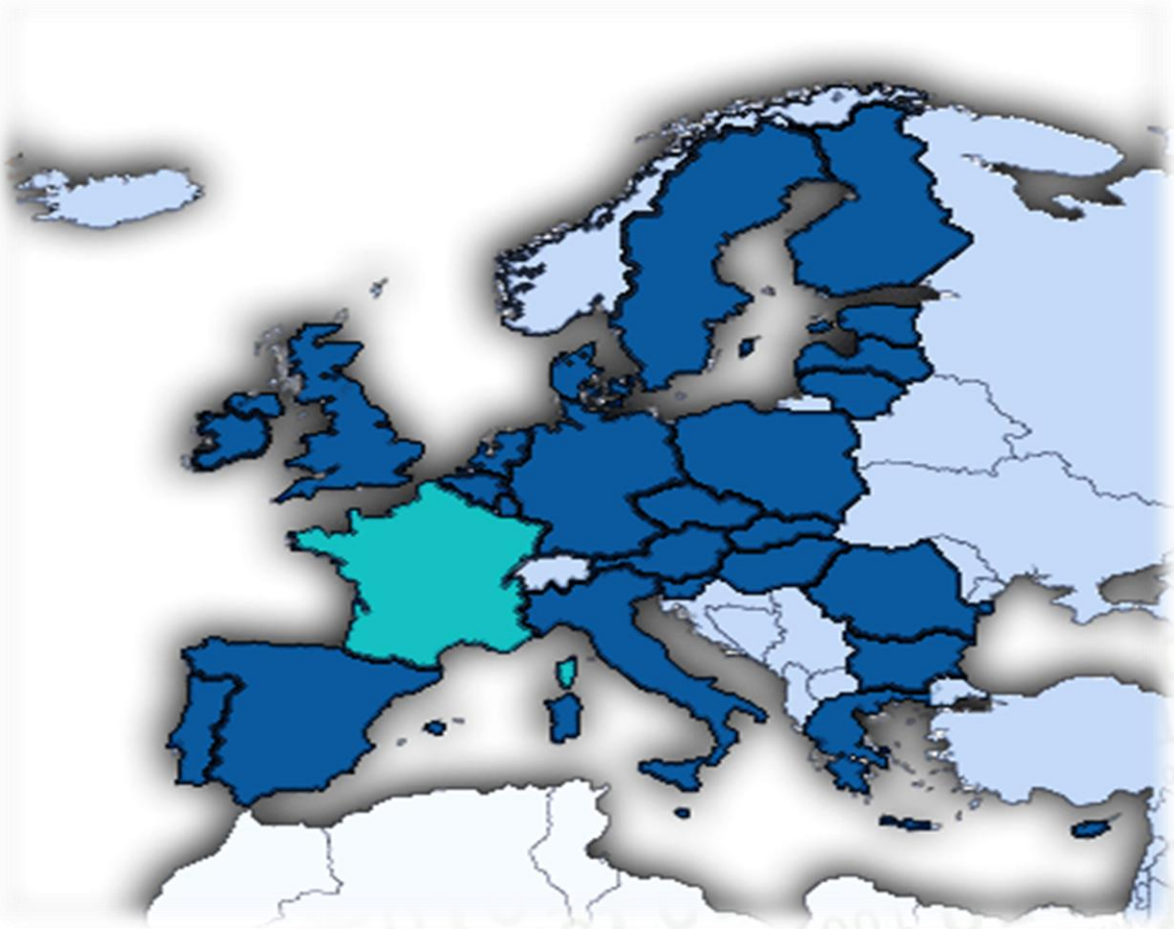
A TIGF INTRODUCTION

TIGF

- Activity: Natural Gas Transport and Storage
- 450 employees
- Major customers are:
  - Industries
  - Other pipeline utilities in France & Spain
- 4,900 km of pipeline
- 560 delivery points
- 550 switching stations
- 4 Compressor Stations for a capacity of 38 MW
- 17 sites in the southwest region of France
- 5.4 Gm^3 of storage capacity across two underground storage areas (Lussagnet & Izaute)

France

TIGF

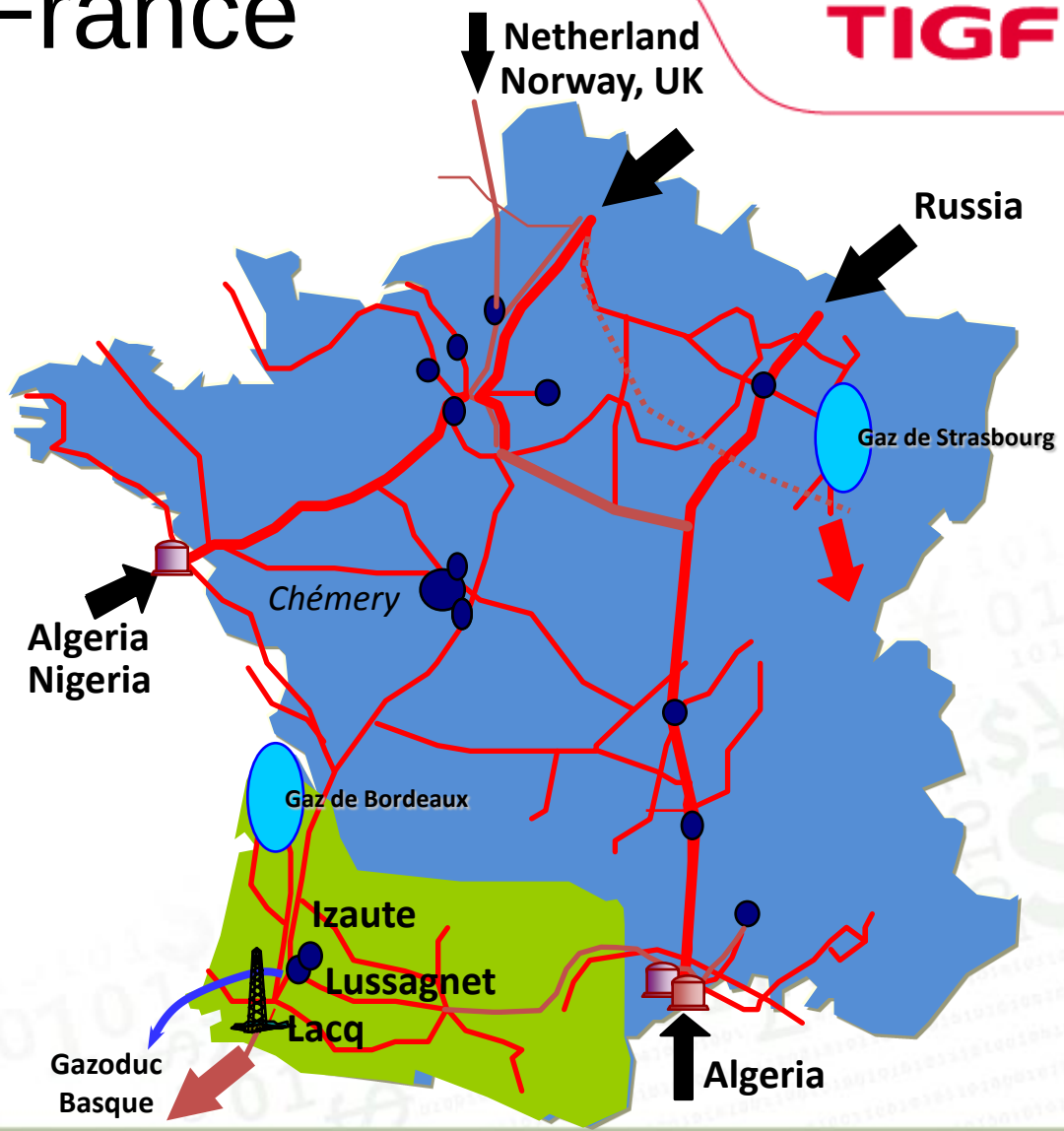


Natural Gas in France

TIGF

Total Capacities :

- Lussagnet : 2.4 Gm3
- Izaute :3.0 Gm3



GRTGAZ

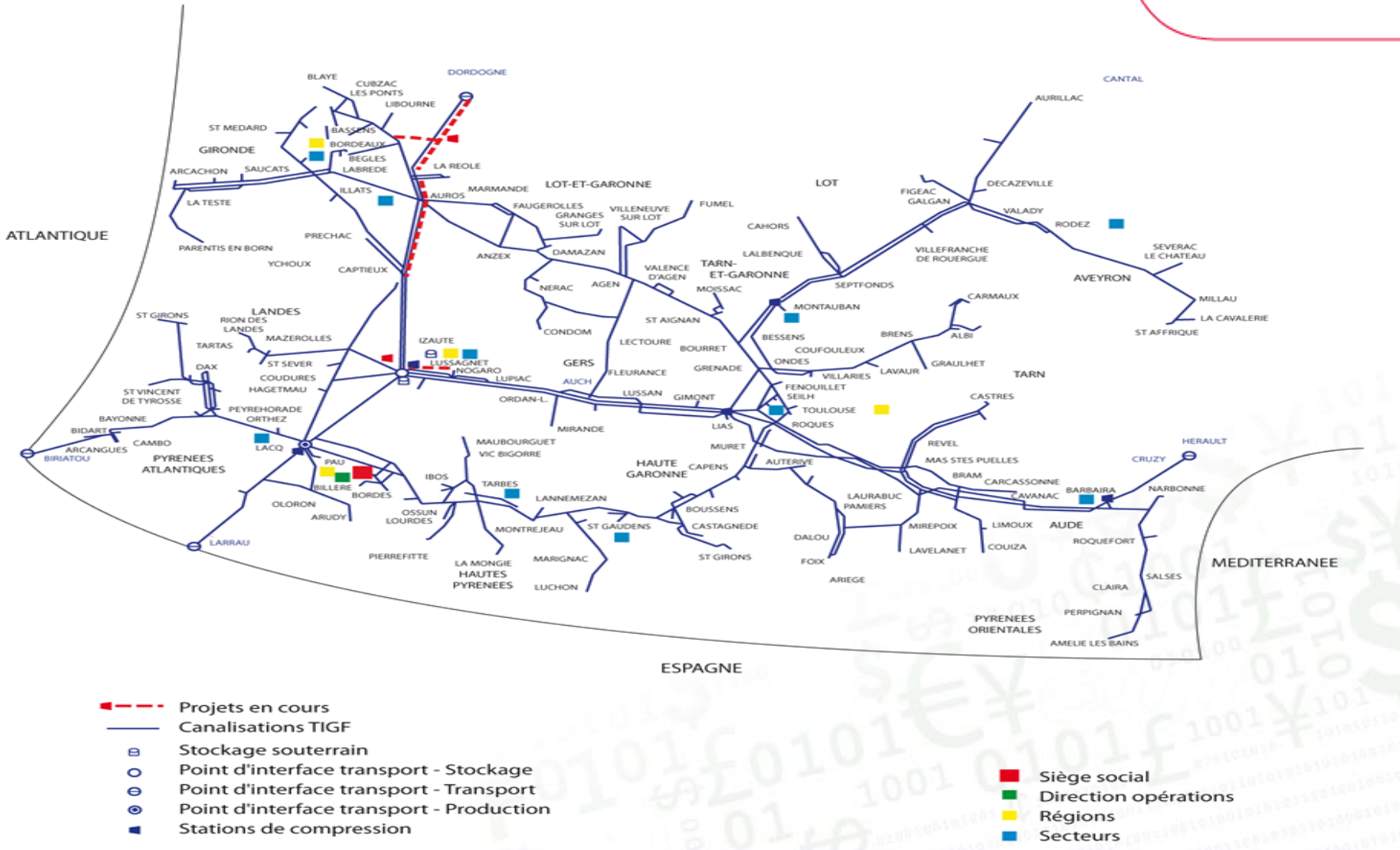
TIGF

Stockage

LNG Terminals

TIGF Natural Gas Infrastructure

TIGF



- Projets en cours
- Canalisations TIGF
- Stockage souterrain
- Point d'interface transport - Stockage
- Point d'interface transport - Transport
- Point d'interface transport - Production
- Stations de compression

- Siège social
- Direction opérations
- Régions
- Secteurs

TIGF in numbers…

2 control centers

- PI Storage
  - Current Tag Count = 10k
  - Target Tag Count = 15k
- PI Transport
  - Current Tag Count = 15k
  - Target Tag Count = 30k

PI Client Tools Usage

- TIGF Favors a central approach
  - PI WebParts = up to 400 users
  - PI PB, PI DL = 10 users

Transport Dispatching

Storage Dispatching

PI @ TIGF

BACKGROUND

TIGF

Growth of PI

2004

- First PI System for Storage Operation

2006

- Second PI System for Transportation Operation

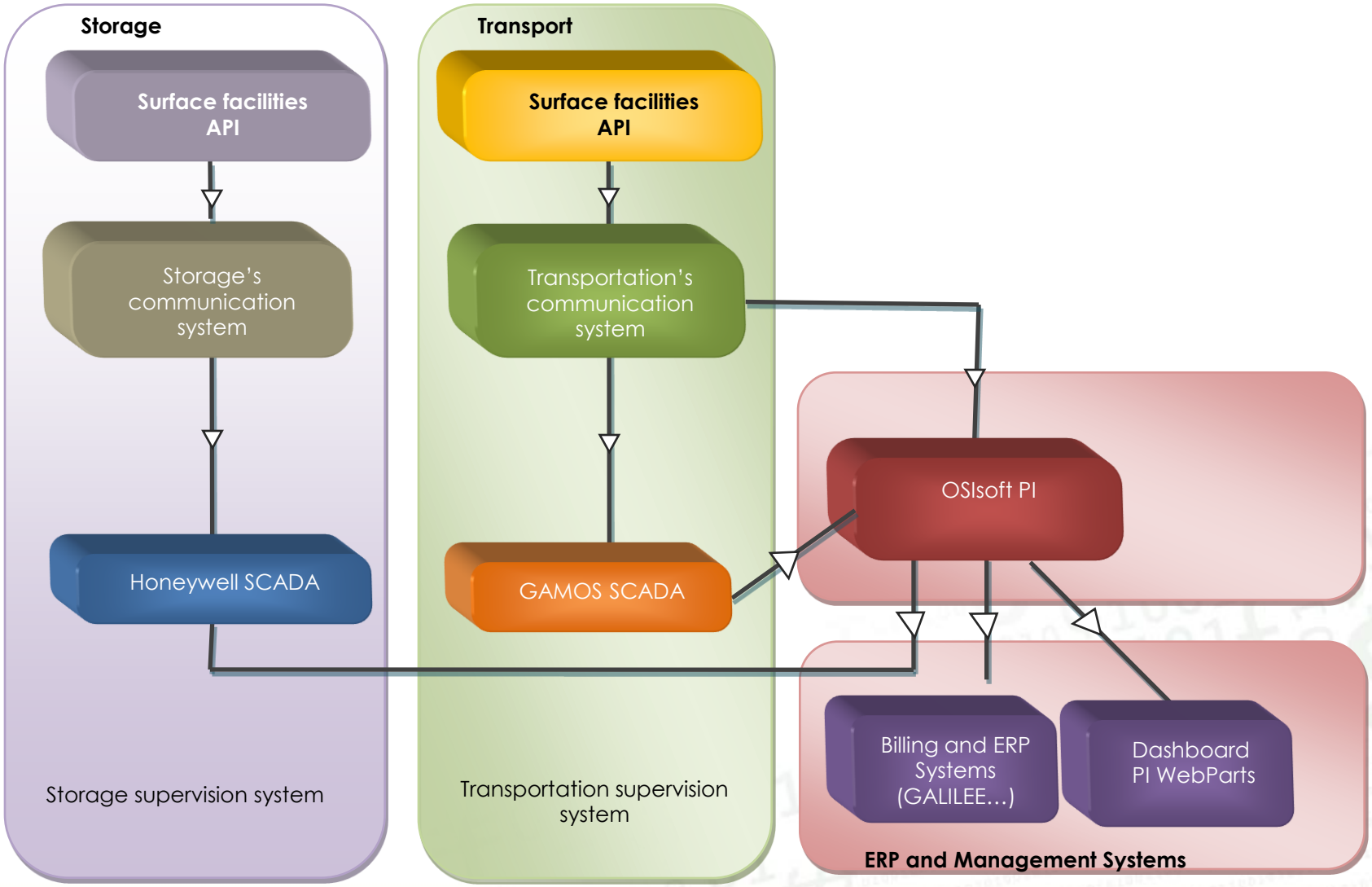
2009

- New Objectives
  - Billing System Integration
  - Increase data Visibility
- Enterprise Agreement

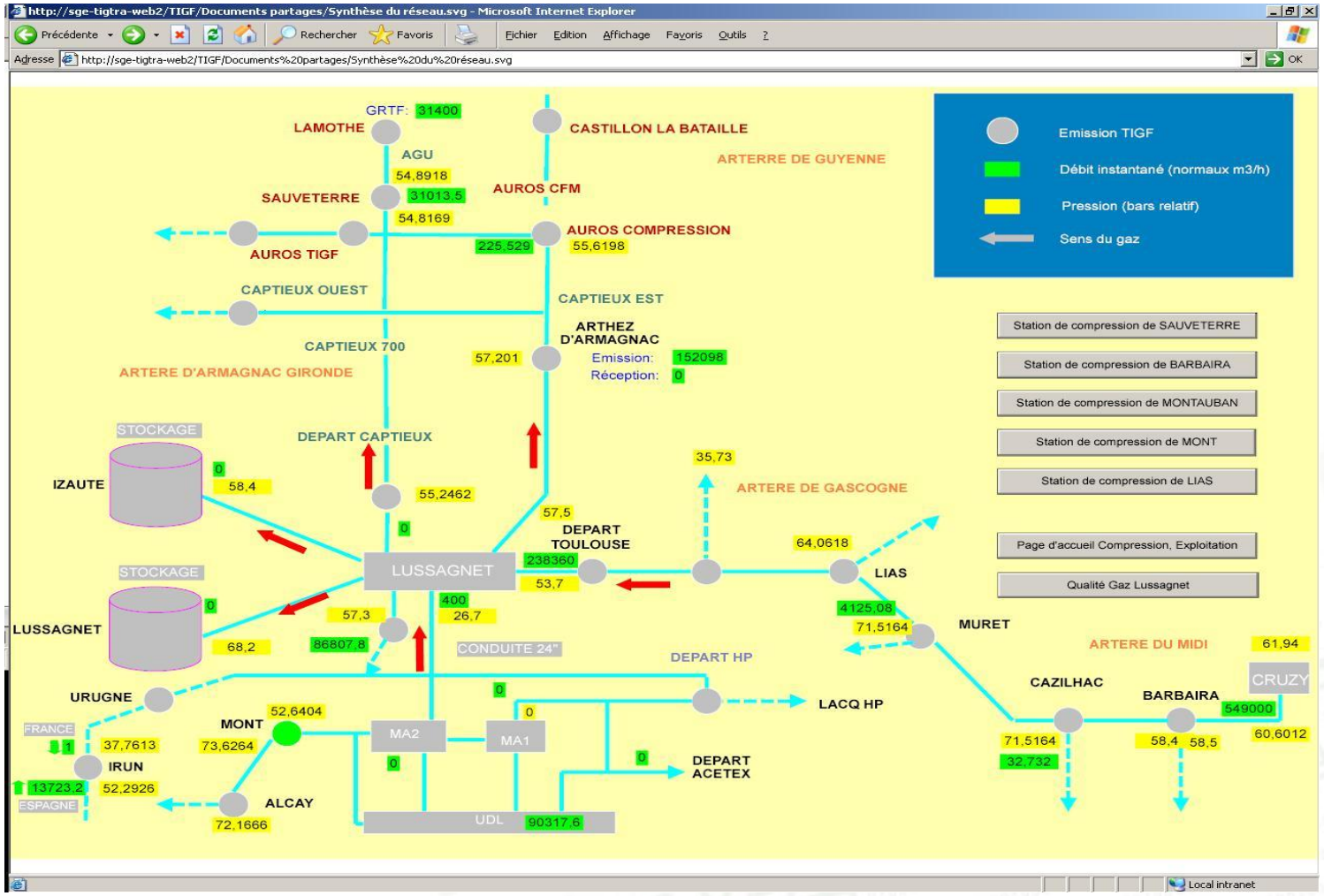
Existing PI assets

- Multi-level PI architecture
  - One PI server for storage
  - One (central) PI server transport, metering and billing (with some data from the storage PI server)
- A wide range of data sources, multiple interfaces
  - 3 OPC interfaces
  - 13 UFL interfaces
  - 3 RDBMS interfaces
  - 3 PI to PI interfaces
- Data post processing with PI ACE calculations
  - 3 modules on PI Storage
  - 7 modules on PI Transport

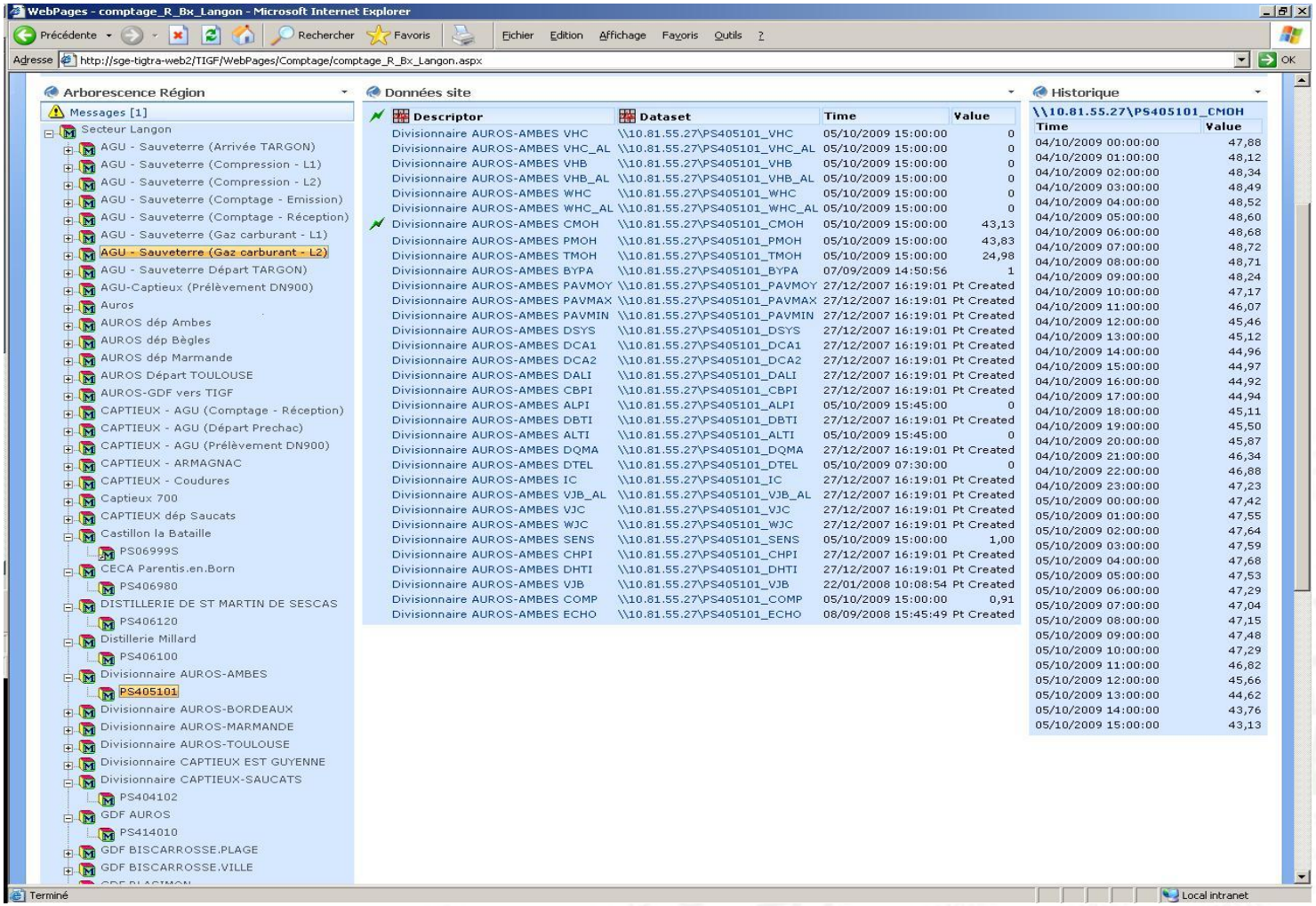
Global PI architecture (before EA)



TIGF Network Operation Dashboard In Real-Time with PI WebParts

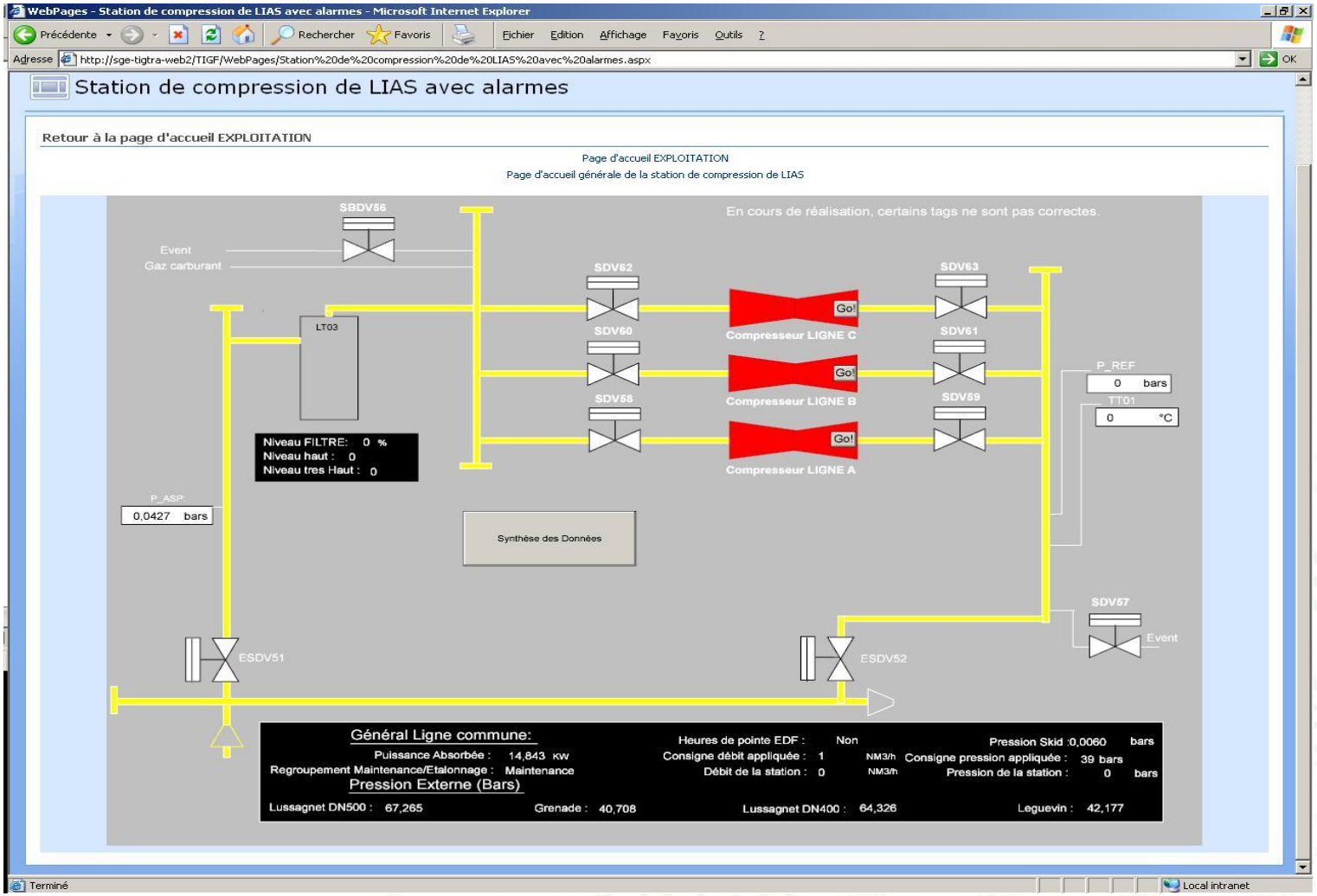


POD Metering data across the network Using the PI Module Database



Quality data web page

Compressor station overview



TIGF PATH TO AN EA

Why an Enterprise Agreement with OSIsoft?

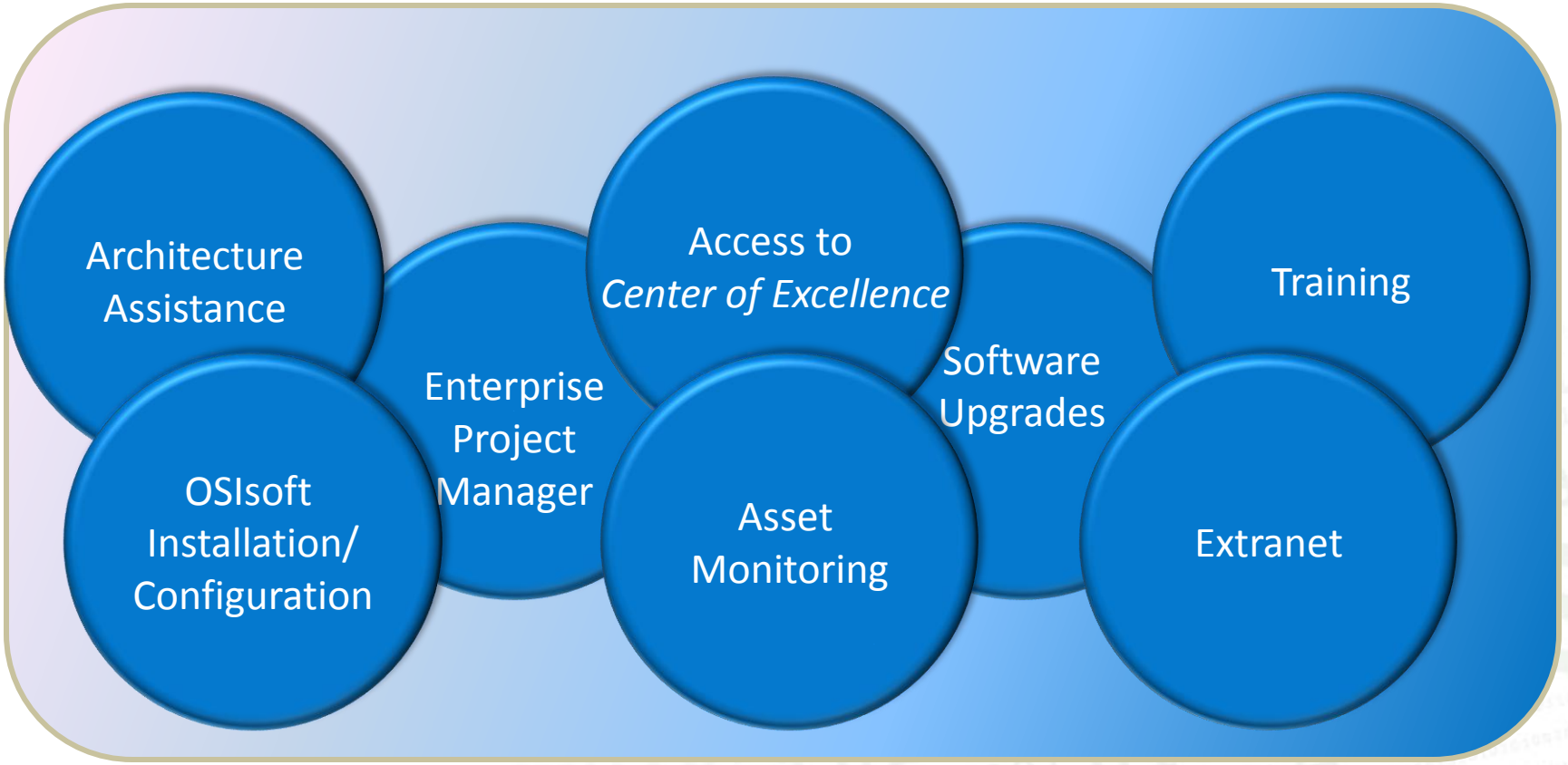
- The need for a more reliable data infrastructure from the meters to the billing system
- The need for the aggregation of SCADA and Non-SCADA Data for the asset optimization initiatives
- The need to secure and strengthen the PI infrastructure at a time when market pushes TIGF to provide data better and faster
- An opportunity to facilite the deployment and the acceptance of PI across the organization
- The need to acquire best practices around PI... from the makers of the PI system:
  - Security
  - Architecture
  - Development of new applications
  - Interactions with existing applications
  - Training

CRE Penalties

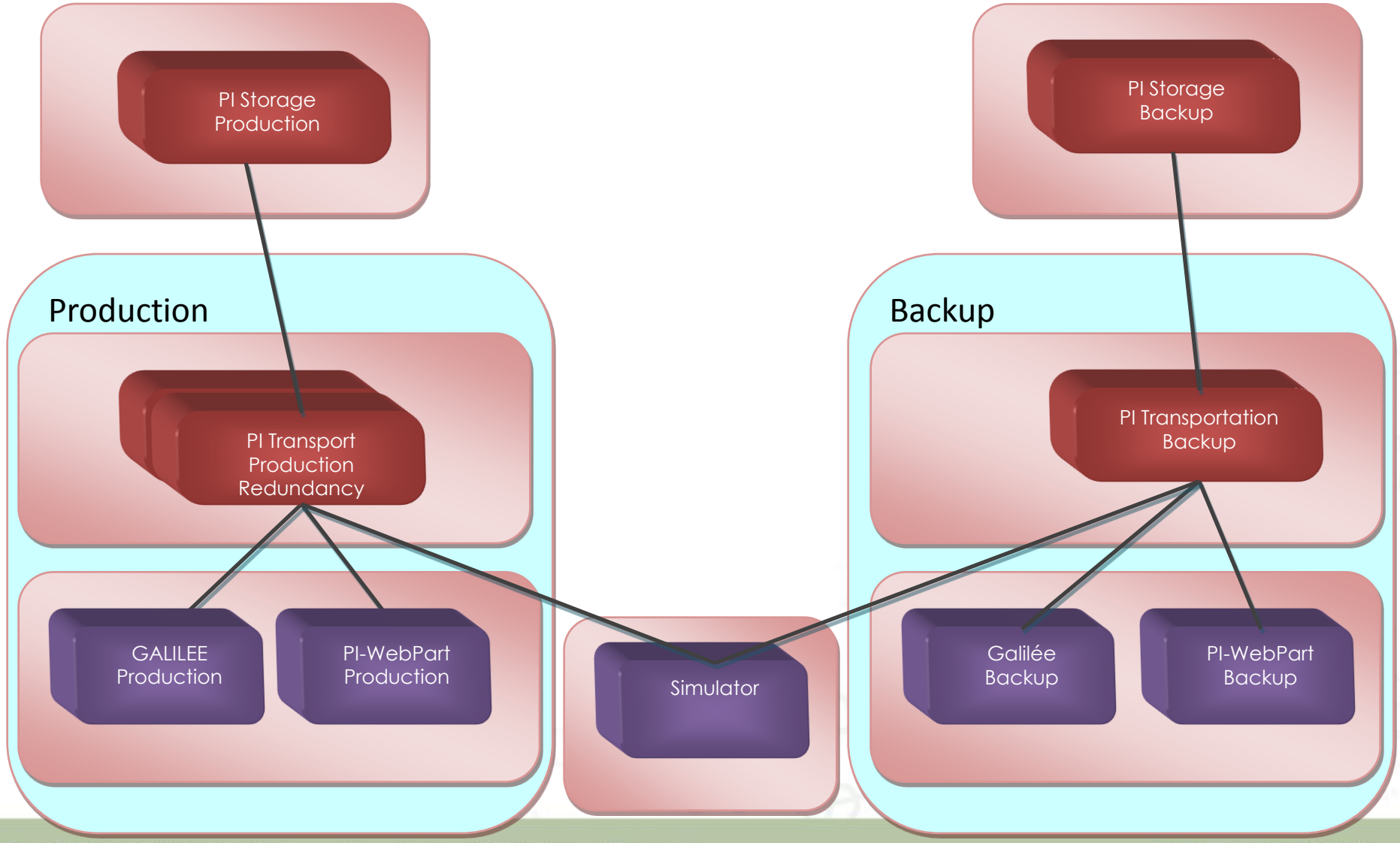
Independent administrative body in charge of regulating the French electricity and gas markets

- The Challenge of Metering Data Quality
- Rule #1
  - Each non-compliant day (> 3%) = € 25 000 penalty
  - Each following day = € 12 500 penalty
- Rule #2
  - TIGF must maintain 93% of conformity on the station
  - € 12 500 penalty for each % below the limit
  - Roughly 8 stations out of 122

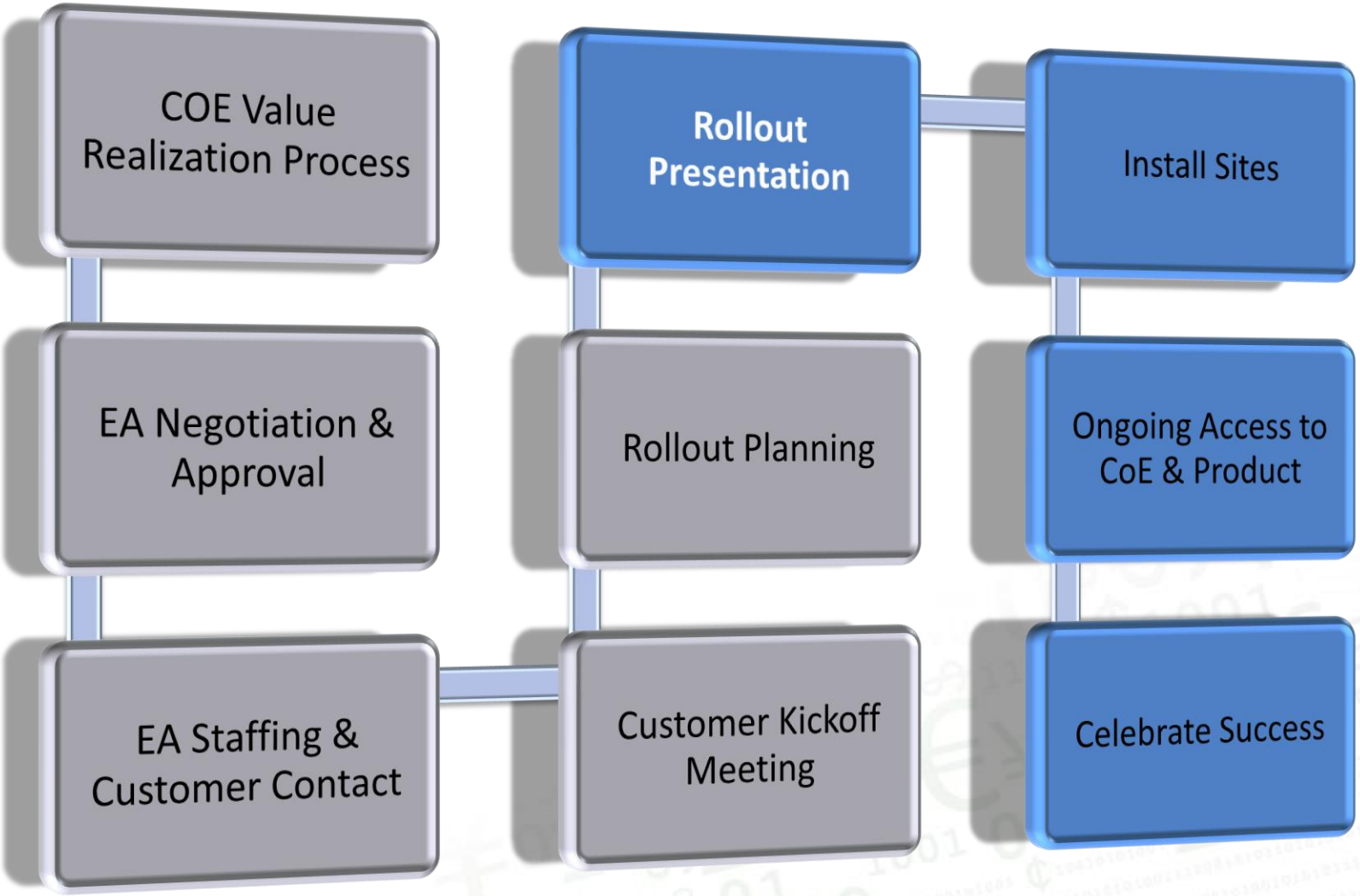
OSIsoft Enterprise Agreement deliverables



TIGF Vision of the Future PI Architecture



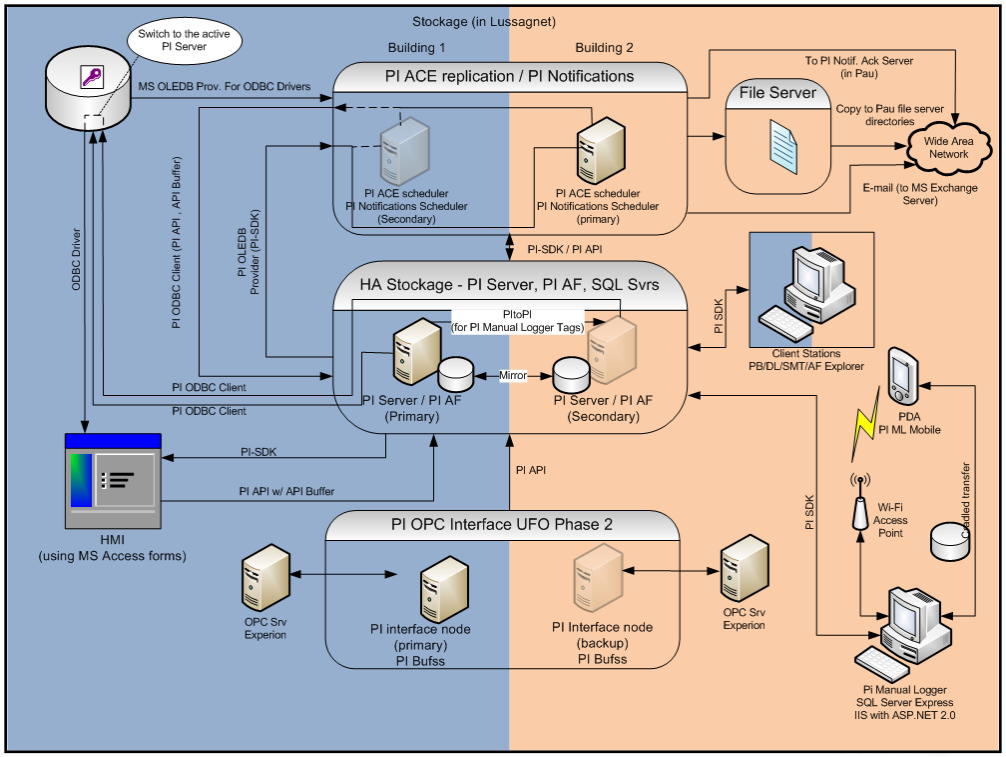
Progress to Date: The Enterprise Process

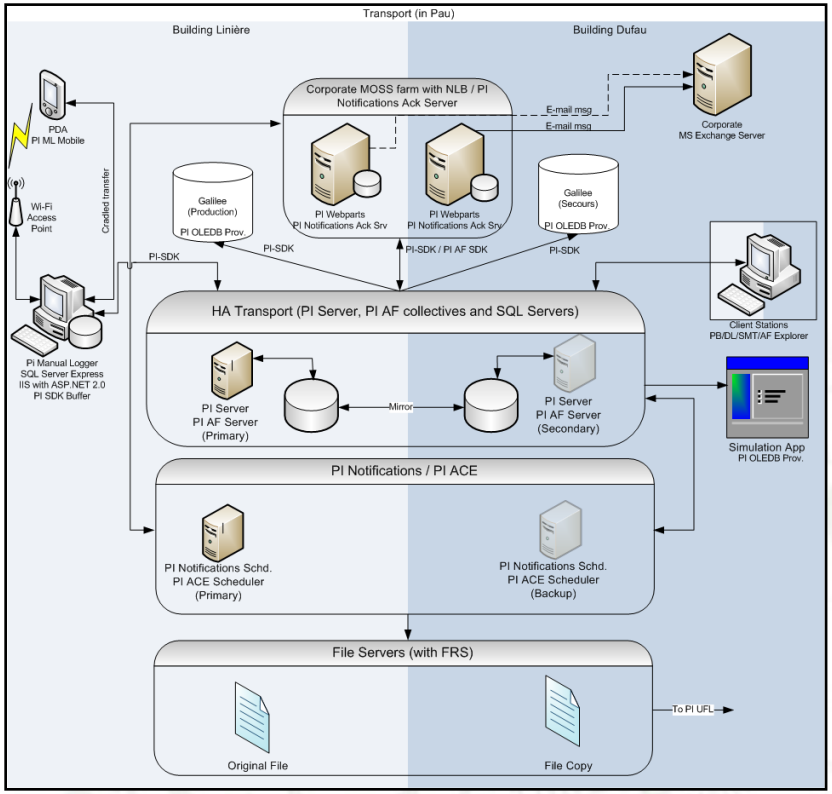


OSIsoft Proposal

- To meet with TIGF requirements for redundant systems
- To provide a better protection of the data and prevent the penalties encountered by TIGF for missing data
- HA provides a fault tolerant solution for:
  - Planned downtimes (OS, Software and Hardware Upgrade, Reconfiguration)
  - Unplanned downtimes (OS, Software and Hardware Failure, Human Error)
- HA does not require any special hardware

Center of Excellence (CoE) Proposed Architecture





Technical Challenges

- PI Deployment started in 2004 – Before the PI HA Architecture

- Proposed Architecture
  - High Availability (PI HA) is the solution proposed by OSIsoft

- Existing Applications Integration
  - Reading from PI
    - The PI SDK based applications have the capability to switch from the different nodes of the collective
  - Writing to PI
    - The PI API based application can generally write to the HA Collective PI Server through the buffering mechanism
    - Annotations require the SDK to write to PI

Prepare for the future

- **Introduction to the new PI Technology**
  - PI Windows Integrated Security (WIS)
  - PI AF
  - PI Notifications
  - PI ManualLogger

- **Future Projects**
  - CBM Projects
  - Integration of a new SCADA system
  - Integration of GIS applications, Vibration Analysis and KPI
  - Integration of a simulation applications
    - Online
    - Short Term
    - Offline

THE BENEFITS FOR TIGF

Observed and expected results

- Productivity
  - Streamline exchange of information within and between the different departments (storage, transport, metering, billing…)
  - Switch from manual data on paper (prone to errors and costly) to electronic data with tools like PI-Manual Logger
  - Accelerate the validation of raw data from the field and distribution of validated data across the organization
  - Develop a more flexible and more performing environment to produce calculations and aggregations
- Cost of operations & availability
  - Use of PI-Batch to track and compare start-ups of major equipments.
  - Predictive maintenance:
    - Tracking the running hours of equipments and by the means of PI-based notifications by email and SMS in the case of abnormal conditions.
    - Track more precisely the running hours of all equipment (total and per range).
    - Vibration analysis (requires additional hardware onsite).

Observed and expected results

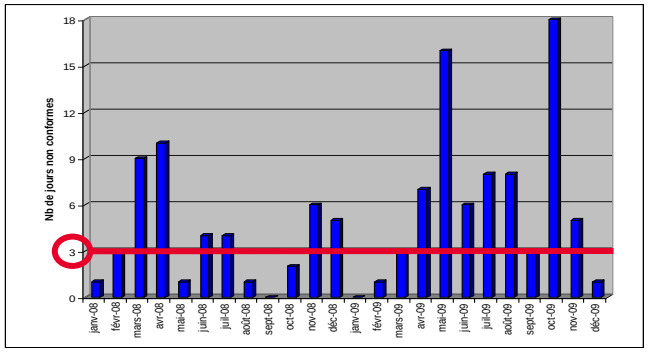
- Visibility
  - Provide a real-time overview on the network operations for the management,
  - Provide access to field data to external actors (contractors, suppliers...)
  - Increase awareness of the maintenance staff before they go on site for inspection and / or repair
- Data Integration
  - Feed simulation with fine, long-term data as well as store the results of simulation, for leakage detection, calibration error detection
  - Integration of PI with GIS system
- Security
  - Isolate the SCADA from the rest of the IT infrastrurture with a strong and reliable PI foundation
  - Isolate industrial IT network with business IT network with a DMZ
- Reliability
  - Maximize the availability of field data for critical processes like billing
- Compliance
  - Ensure the traceability of all operations parameters
- Quality

Observed and expected results

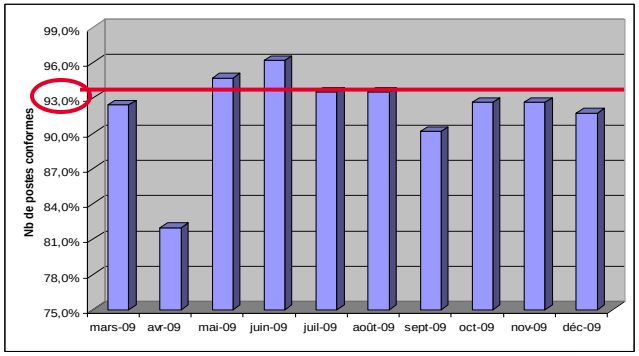
- Safety
  - Need to have hyperlinks to images representing the aerial view of the site, picture of the stations, terrain view, etc in order to allow the operation engineer to proper guide the fire station officers to easily act in case of an accident.
- Harmonization of IT
  - PI allows getting rid of the issue of duplicate information

CRE Penalties...

- Rule #1



- Rule #2



- 2009 – Several instances of non-conformity
- 2010 – Since the implementation of the PI Data, TIGF paid **€ 0** penalty
- 2010… - Looking to improve the system reliability with HA and other redundancy features

Questions

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Thank you