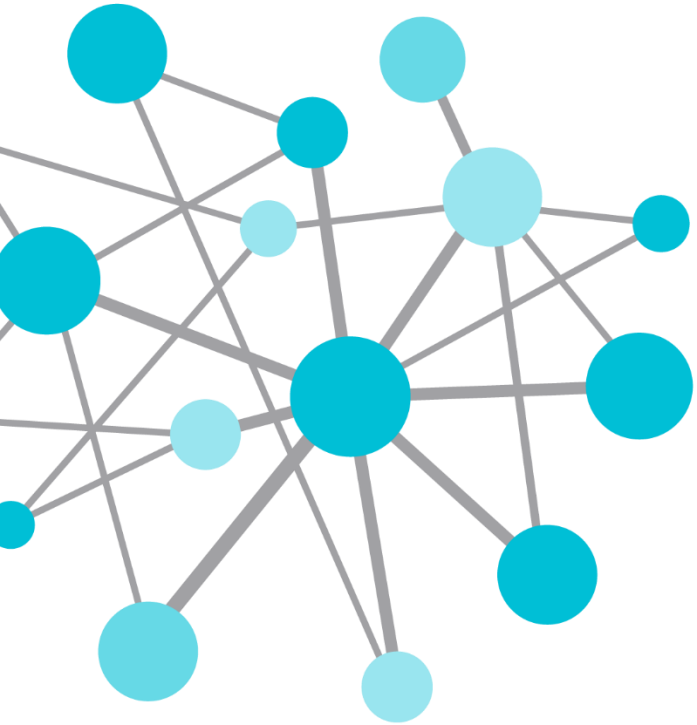


SKIPPER Project: Production Management Using a PI System Infrastructure

Presented by **Jorge Neves**

The Company

Main brands worldwide

Renewables

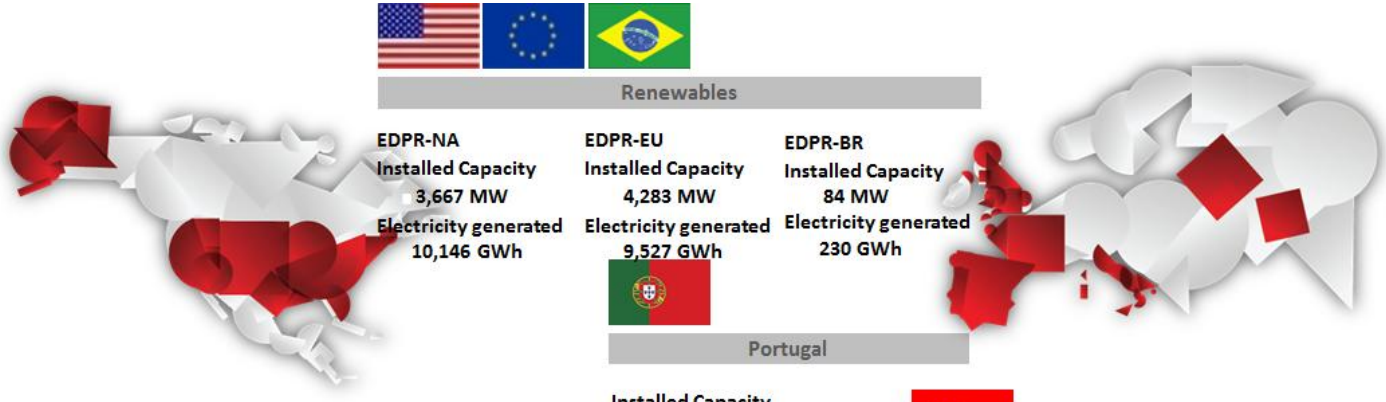
edp renováveis

Brazil

Portugal

Spain

EDP… A reference company in the Iberian market with a strong presence in Brazil and considerable investments in the USA…



Renewables

EDPR-NA
Installed Capacity
3,667 MW
Electricity generated
10,146 GWh

EDPR-EU
Installed Capacity
4,283 MW
Electricity generated
9,527 GWh

EDPR-BR
Installed Capacity
84 MW
Electricity generated
230 GWh

Portugal

Installed Capacity
8,911 MW

Electricity
22,723 GWh generated
43,858 GWh distributed
5,718 thousand Customers

Gas
6,938 GWh distributed
224 thousand Customers

Brazil

Installed Capacity
2,157 MW

Electricity
8,360 GWh generated
25,880 GWh distributed
3,045 thousand Customers

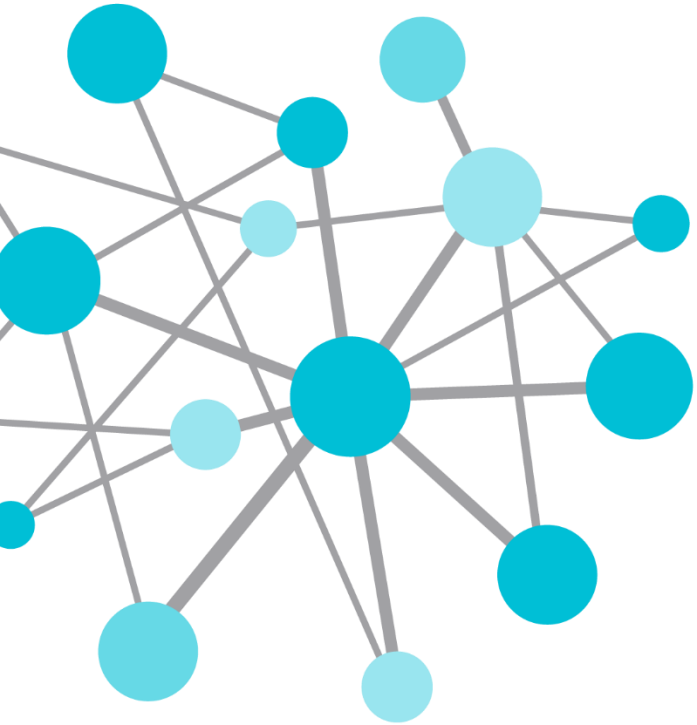
Spain

Installed Capacity
3,853 MW

Electricity
9,961 GWh generated
9,147 GWh distributed
1,118 thousand Customers

Gas
51.535 GWh distributed
796 thousand Customers

* MW EBITDA



SKIPPER

SKIPPER

System, Knowledge, Information, Plant Performance & EnviRonment

Building a global network of energy, multi-geography.

A vector to achieve the asset management strategy of generation in the EDP Group

Business Challenge

- Provide the group companies with an integrated information system to support the management and monitoring of the generation assets.
- Support the internationalization of EDP group.
- Implement a plan to deal with future organizational challenges.
- Sharing of the best practices and technology as well as the retention of knowledge.

Solution

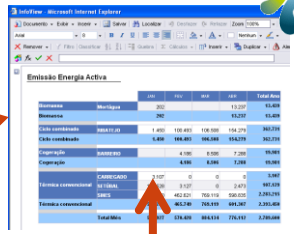
- Connection of the data sources - DCS, SCADA, energy meters, to PI Systems.
- SharePoint Portal with PI WebParts and PI DataLink for Excel Services.
- Relational database for other sources and Business Intelligence.
- BO reporting.

Infrastructure

Skipper
rede global de energia

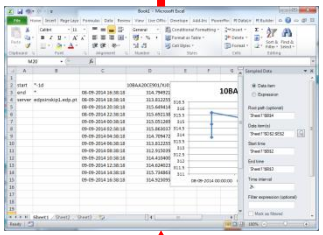
SharePoint Portal SKIPPER

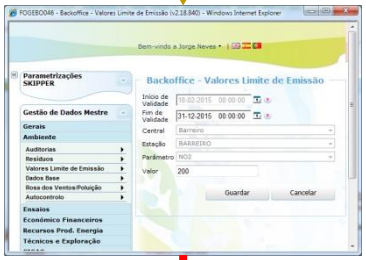
BO

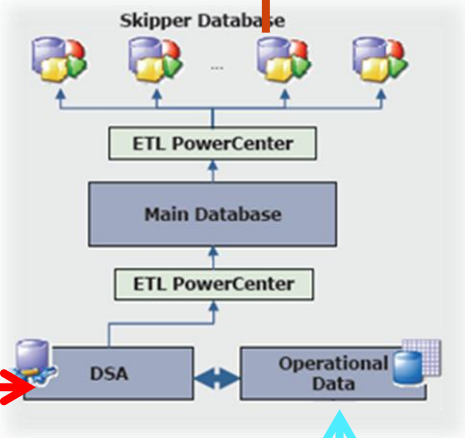


PI DataLink

PI WebParts





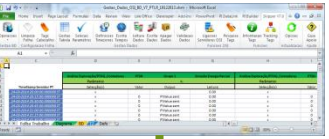


Forms

PI Servers

PI Interfaces

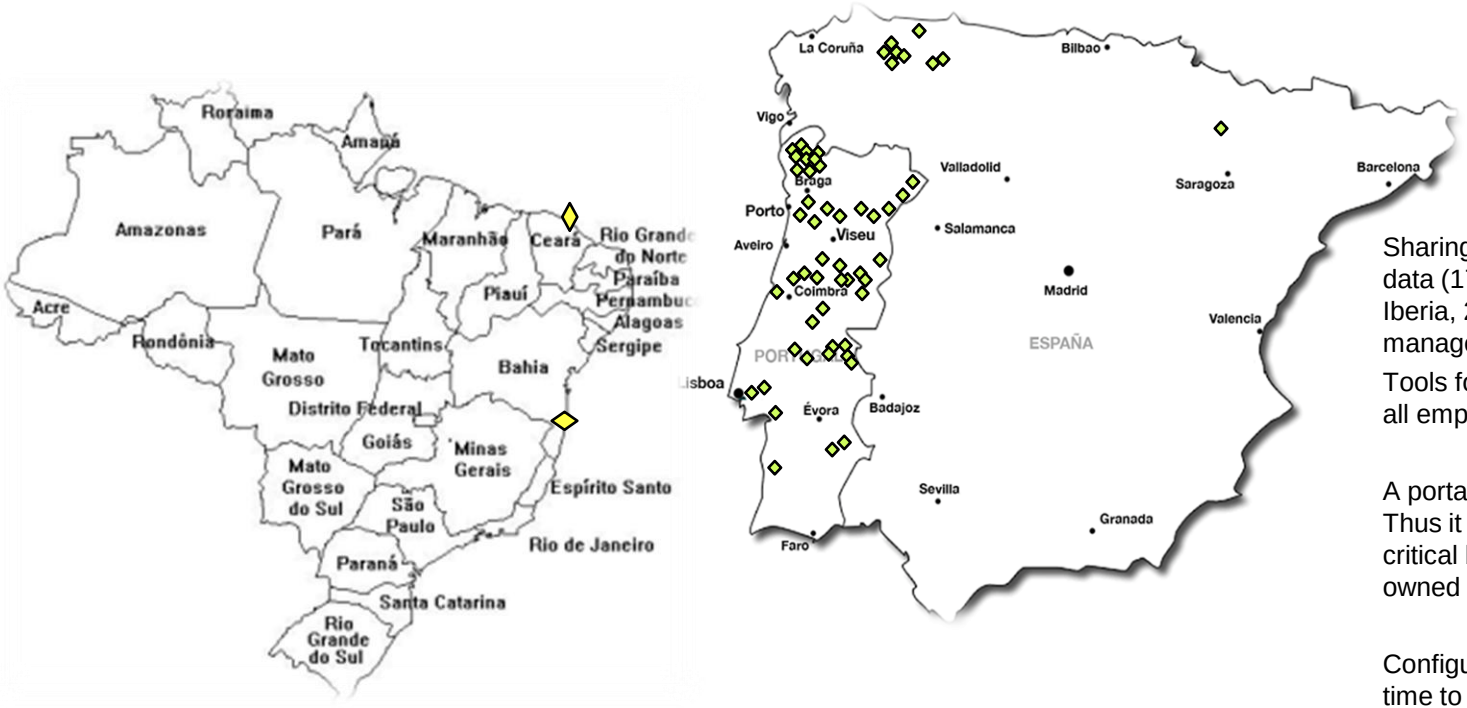
PI Interface for Relational Database (RDBMS via ODBC)



PI SDK Manual Input

SKIPPER

Is in Portugal, Spain and in Brasil (development phase)



Sharing environment for all company data (170,000 variables in real time in Iberia, 27 BO Universes with hundreds of management indicators).

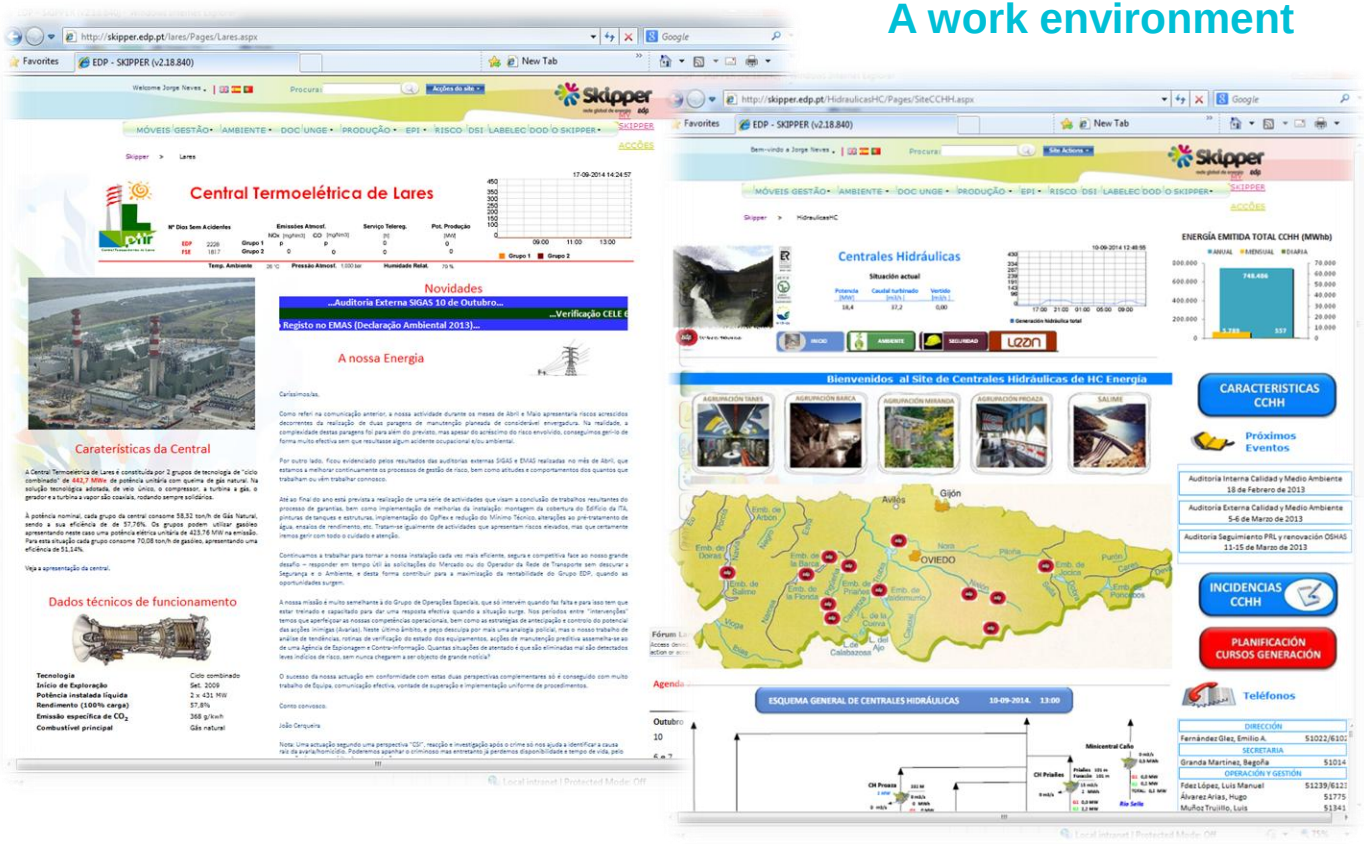
Tools for publishing content, available to all employees.

A portal to share user-generated content. Thus it encourages the emergence of critical business knowledge that is often owned by a single employee.

Configuration tools, responsive in real time to new requirements for data collection.

Portal

A work environment



Provide an accessible way to the underlying data of the activity of the company in an environment that allows the sharing of best practices and technologies and the collaboration between human capital (knowledge assets).

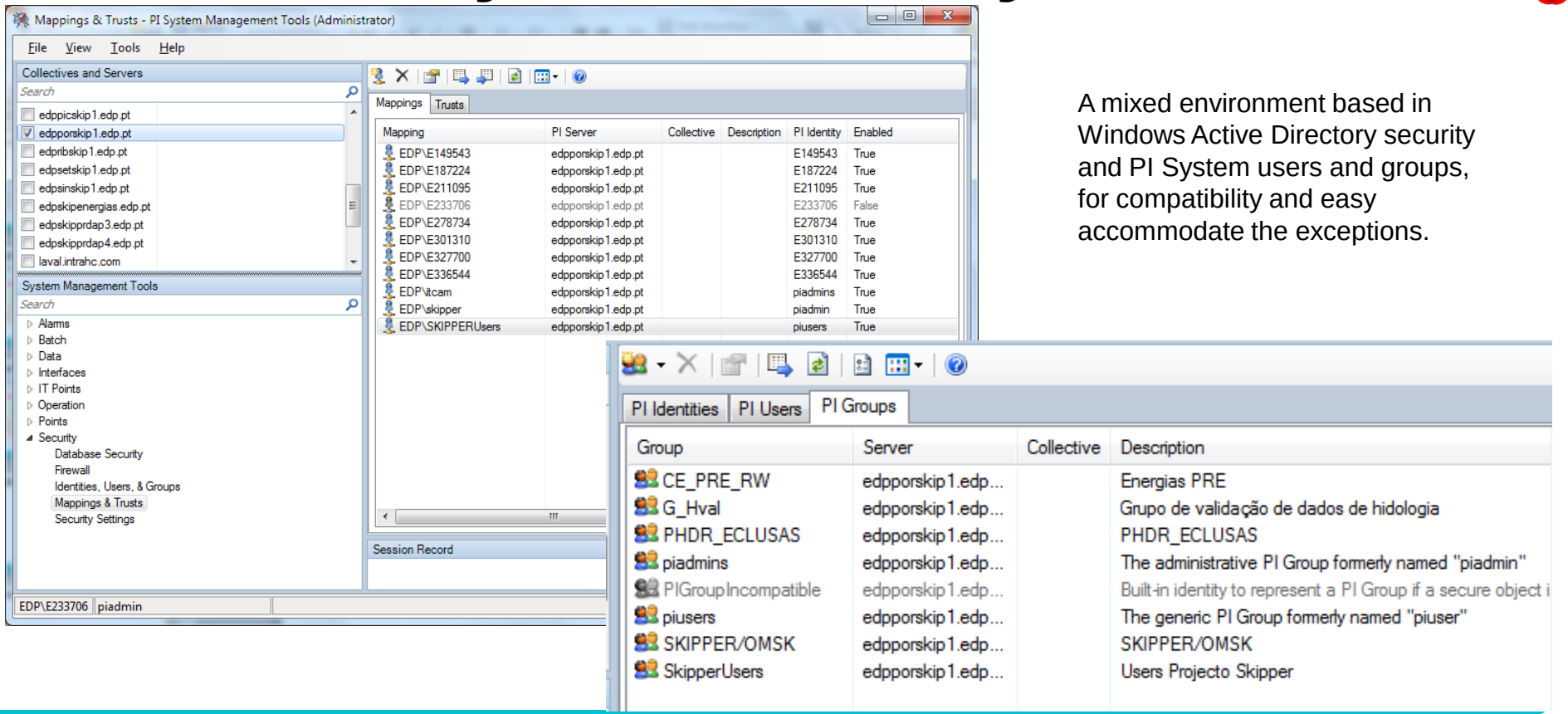
Give life and transforming the data into information to enhance the competitive advantage.

Organize and add sense to the data in order to make it understandable.

Allow to identify, locate and ease access to knowledge assets (organizational memory).

Increase the creation of new knowledge, leading to the formation of competitive advantages

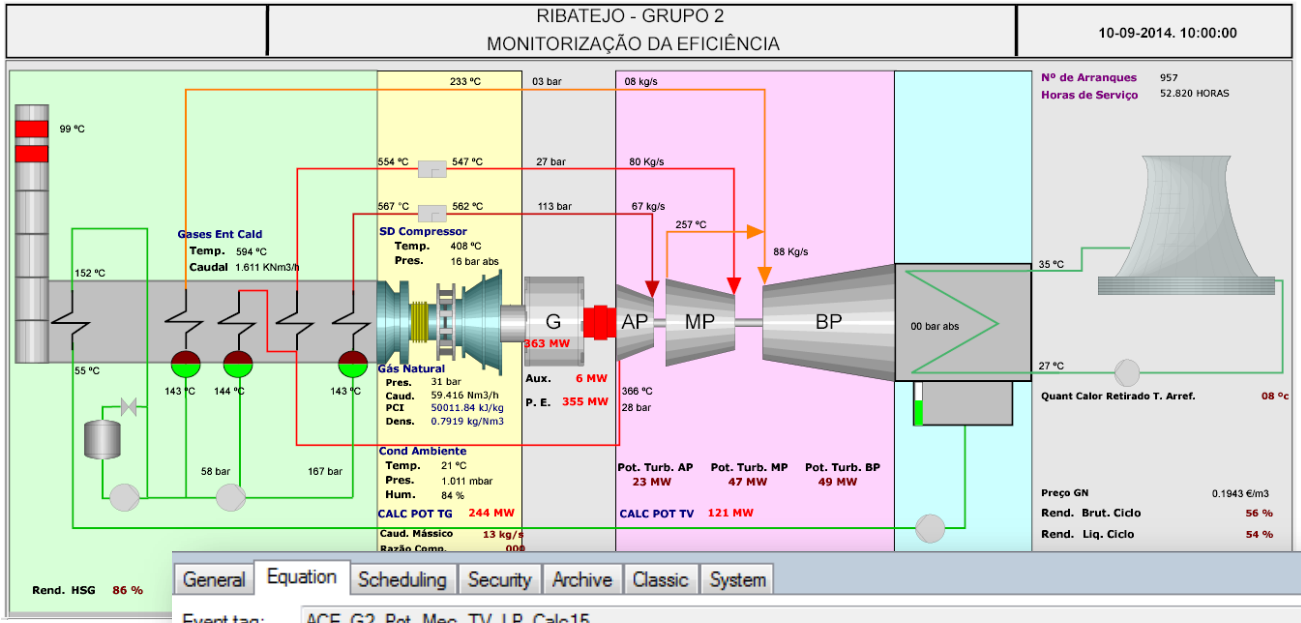
OSIsoft PI System Security

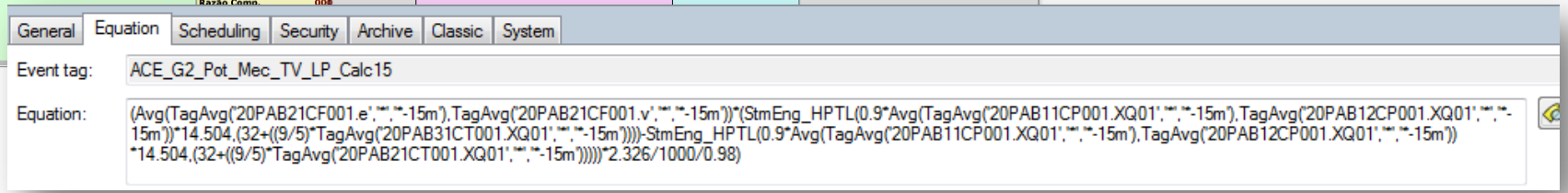


A mixed environment based in Windows Active Directory security and PI System users and groups, for compatibility and easy accommodate the exceptions.

Applications

Monitorization

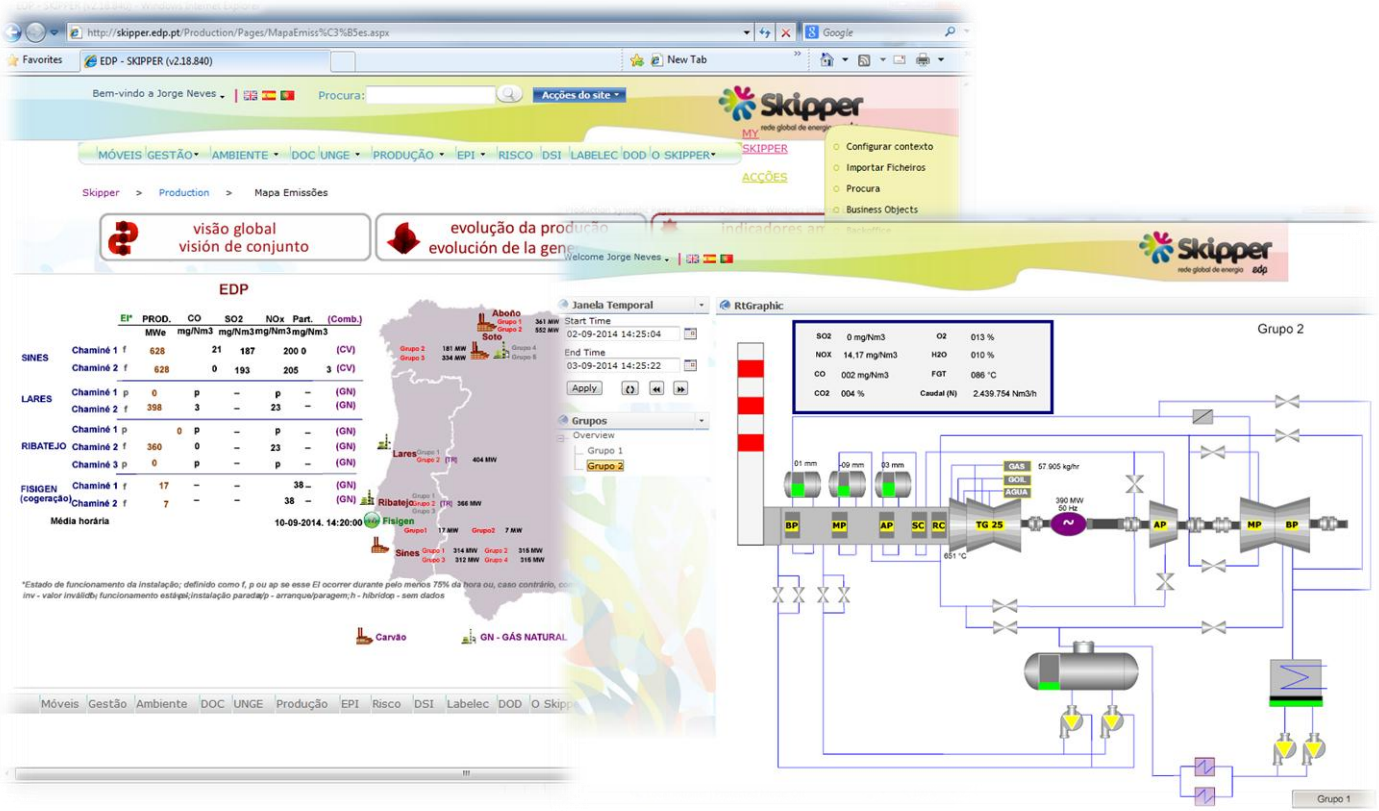




A set of displays with raw data and a calculated data.

Heavy use of PI Performance Equations and Steam Functions to monitor the efficiency of the turbo-groups, boilers and other machines with special importance in thermodynamic performance.

Environment



Provide the tools for the management of environmental data - atmospheric emissions, air quality, water consumption and wastewater.

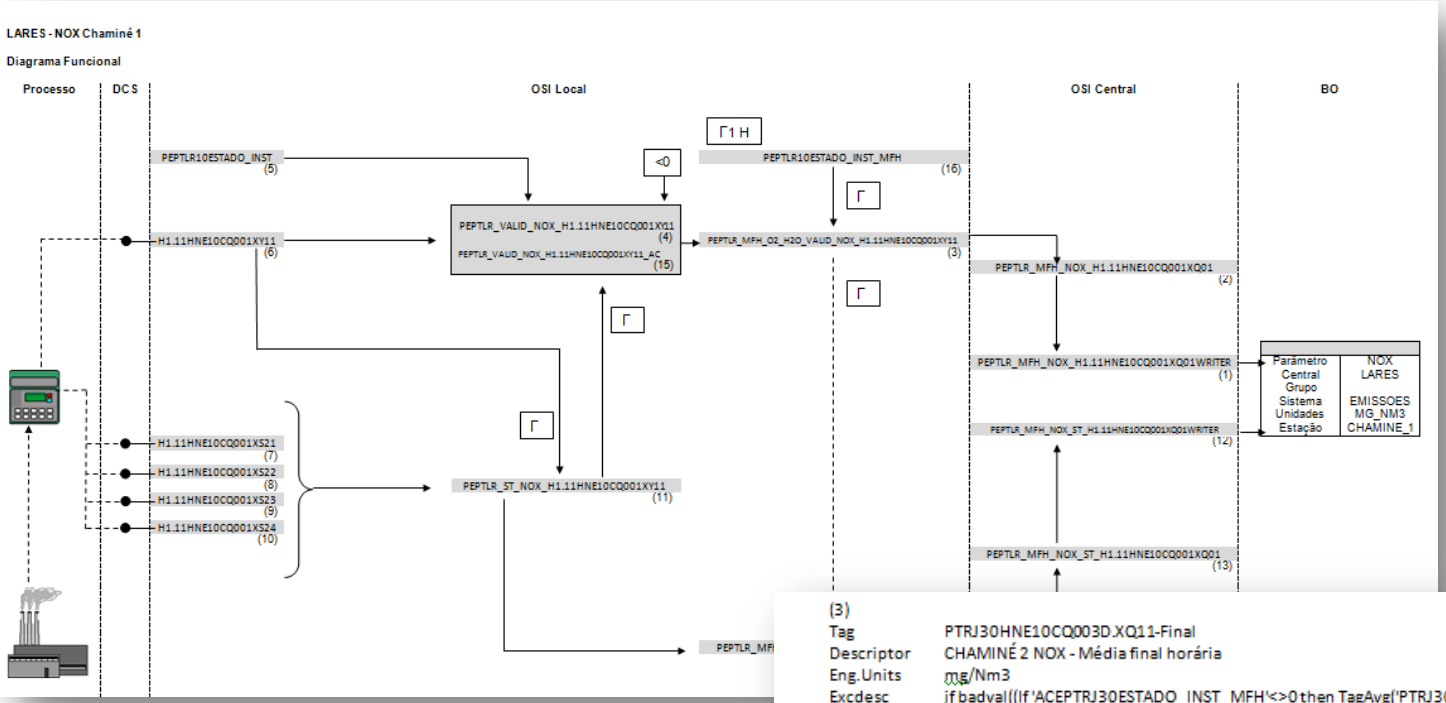
Consolidation of environmental data.

Automatic data validation with the operation of the facility and state of the measuring apparatus.

Manual data entry in OSIsoft PI System for manual validation.

Automatic integration of data in an Oracle database for reports with BO.

Environment

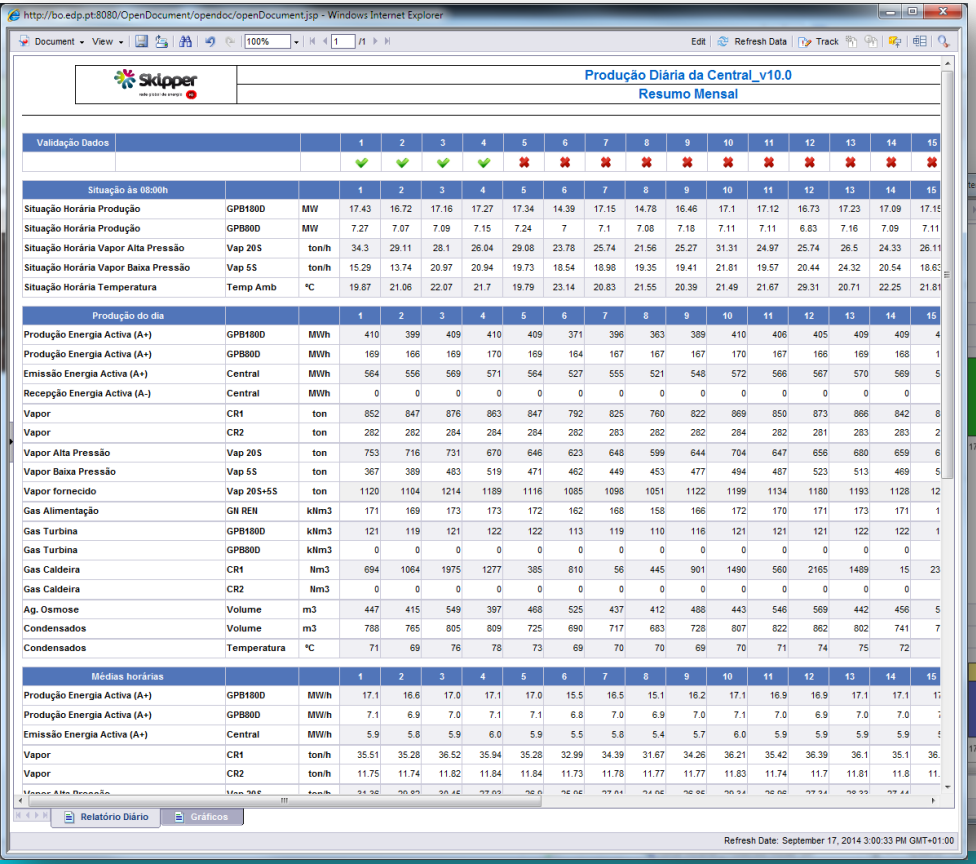


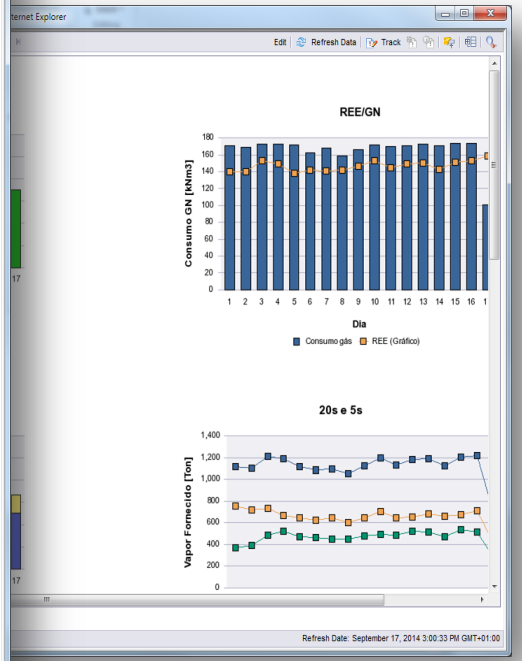
(3)

Tag	PTRJ30HNE10CQ003D.XQ11-Final
Descriptor	CHAMINÉ 2 NOX - Média final horária
Eng.Units	mg/Nm3
Excdesc	if badval((If 'ACEPTRJ30ESTADO_INST_MFH'<>0 then TagAvg('PTRJ30HNE10CQ003D.XQ11-ValidosHor','*-1h','*') else If 'ACEPTRJ30ESTADO_INST_MFH'= 0 then TagAvg('PTRJ30HNE10CQ003D.XQ11-ValidosHor_AC','*-1h','*') else "No Sample")=1 then "No Sample" else If 'ACEPTRJ30ESTADO_INST_MFH'<>0 then TagAvg('PTRJ30HNE10CQ003D.XQ11-ValidosHor','*-1h','*') else If 'ACEPTRJ30ESTADO_INST_MFH'= 0 then TagAvg('PTRJ30HNE10CQ003D.XQ11-ValidosHor_AC','*-1h','*') else "No Sample"
Observações	Event=ACEPTRJ30ESTADO_INST_MFH Calcula a média horária dos valores validados de NOx de acordo com o estado da instalação assumido

Automatic acquisition, calculation, validation and integration of environmental data for reporting.

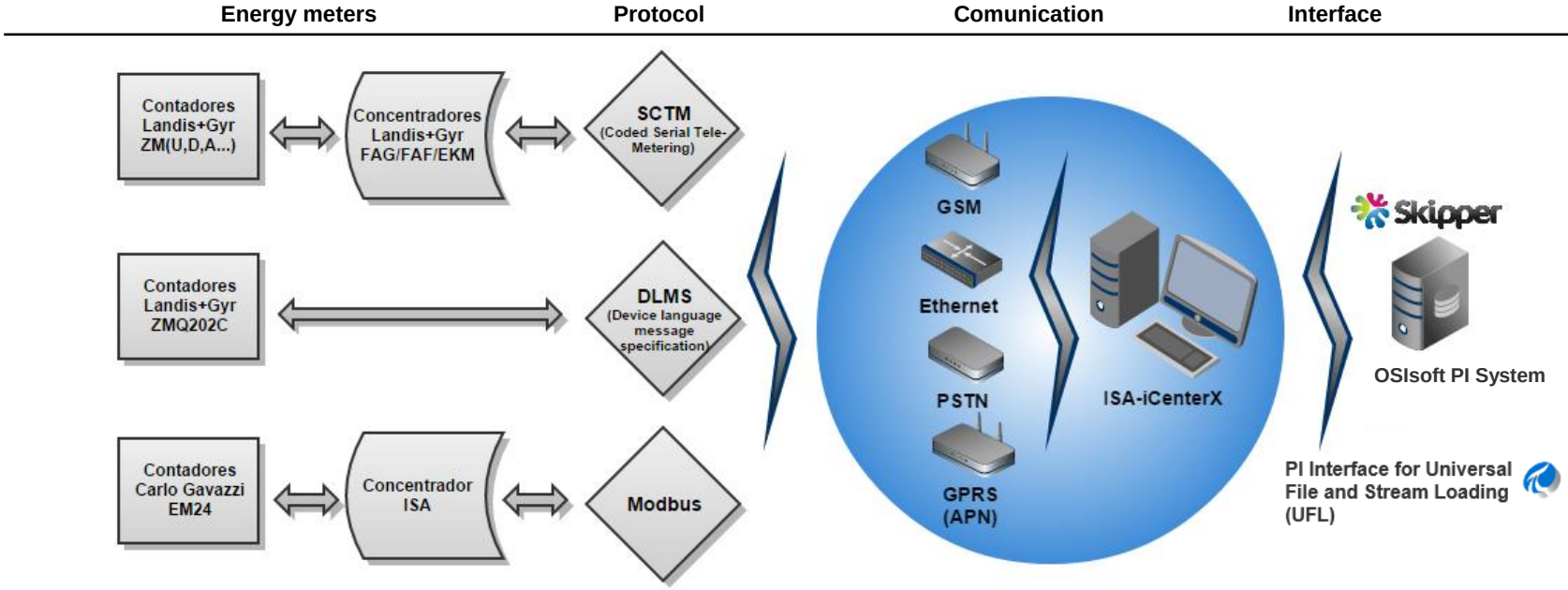
BO Reporting





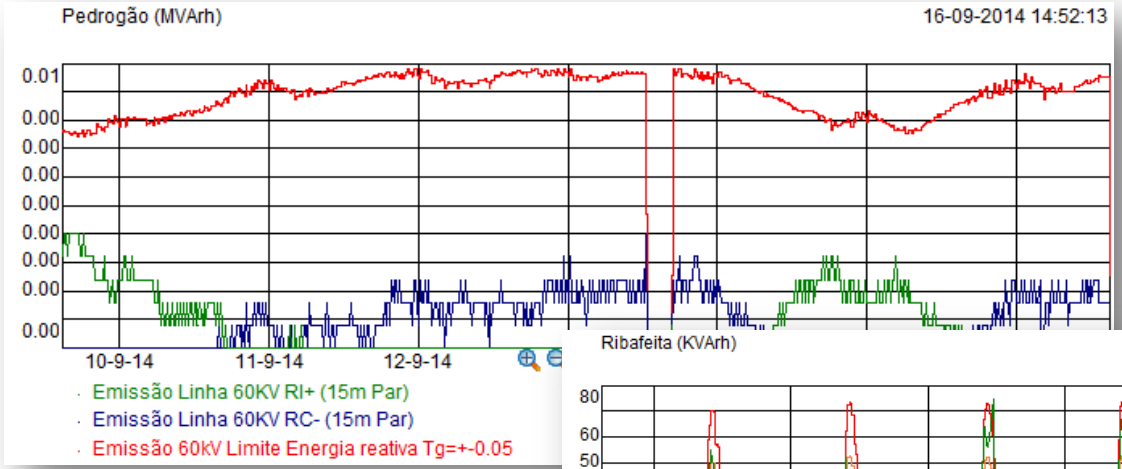
Reporting with Business Objects for data integrated from the OSIsoft PI Data Archive and relational data from other sources.

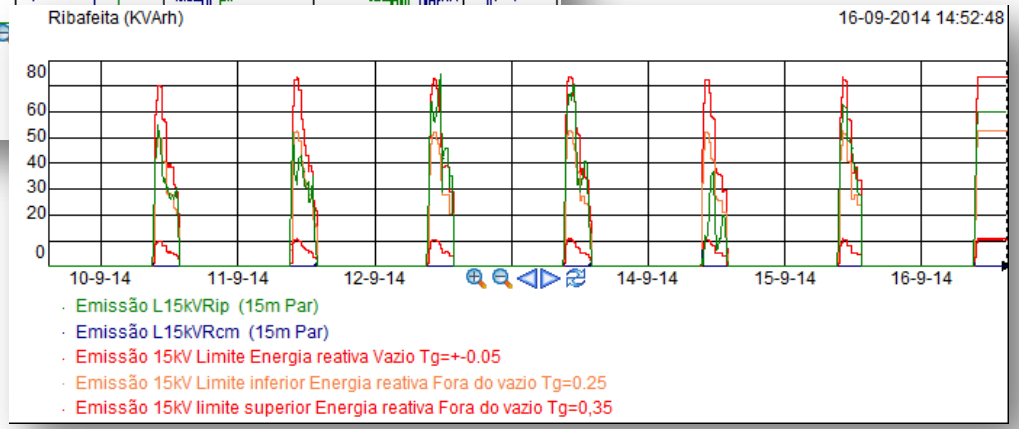
Energy metering



Power Plants	Metering points	Nº of Tags
65	456	10533

Energy metering





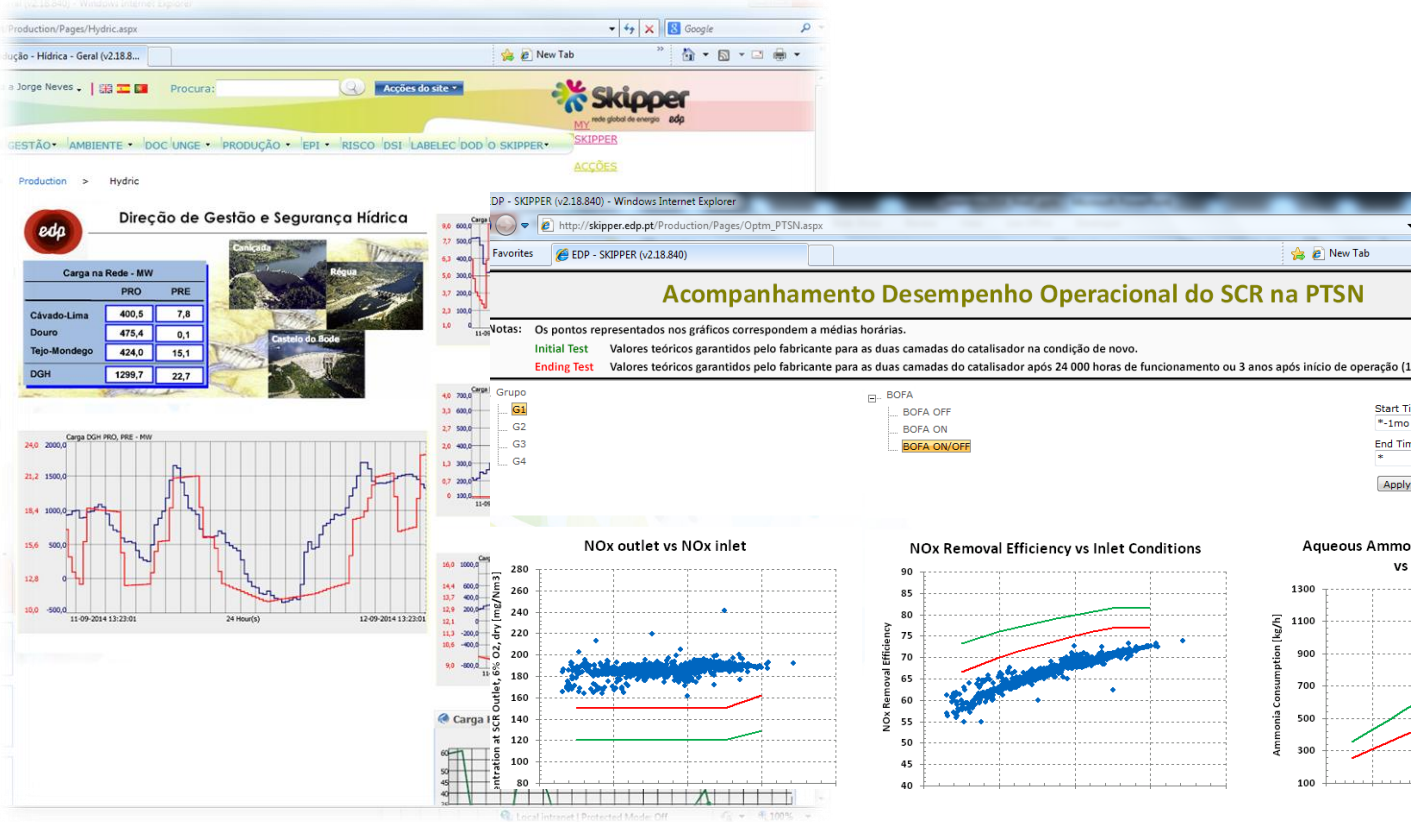
Cost control of the production process.

Optimization of exploitation in order to energy efficiency – control of reactive power.

Billing control.

Identifying areas for improvement.

Exploitation analysis



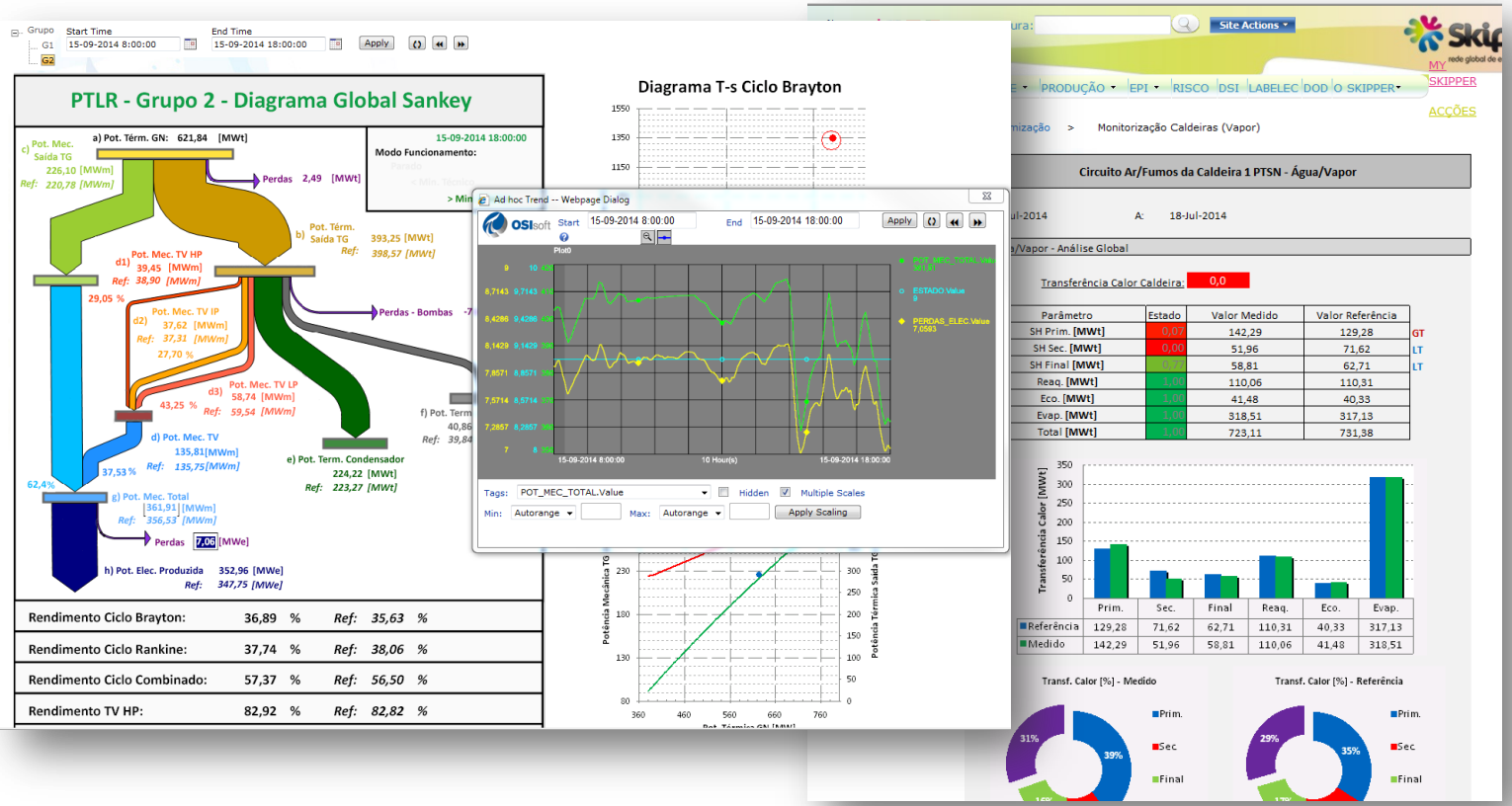
Optimizing the operating processes and optimizing performance in power generation plants.

Analysis of operational and critical variables.

Performance

Analyze the performance of the production versus demand.

Maintenance

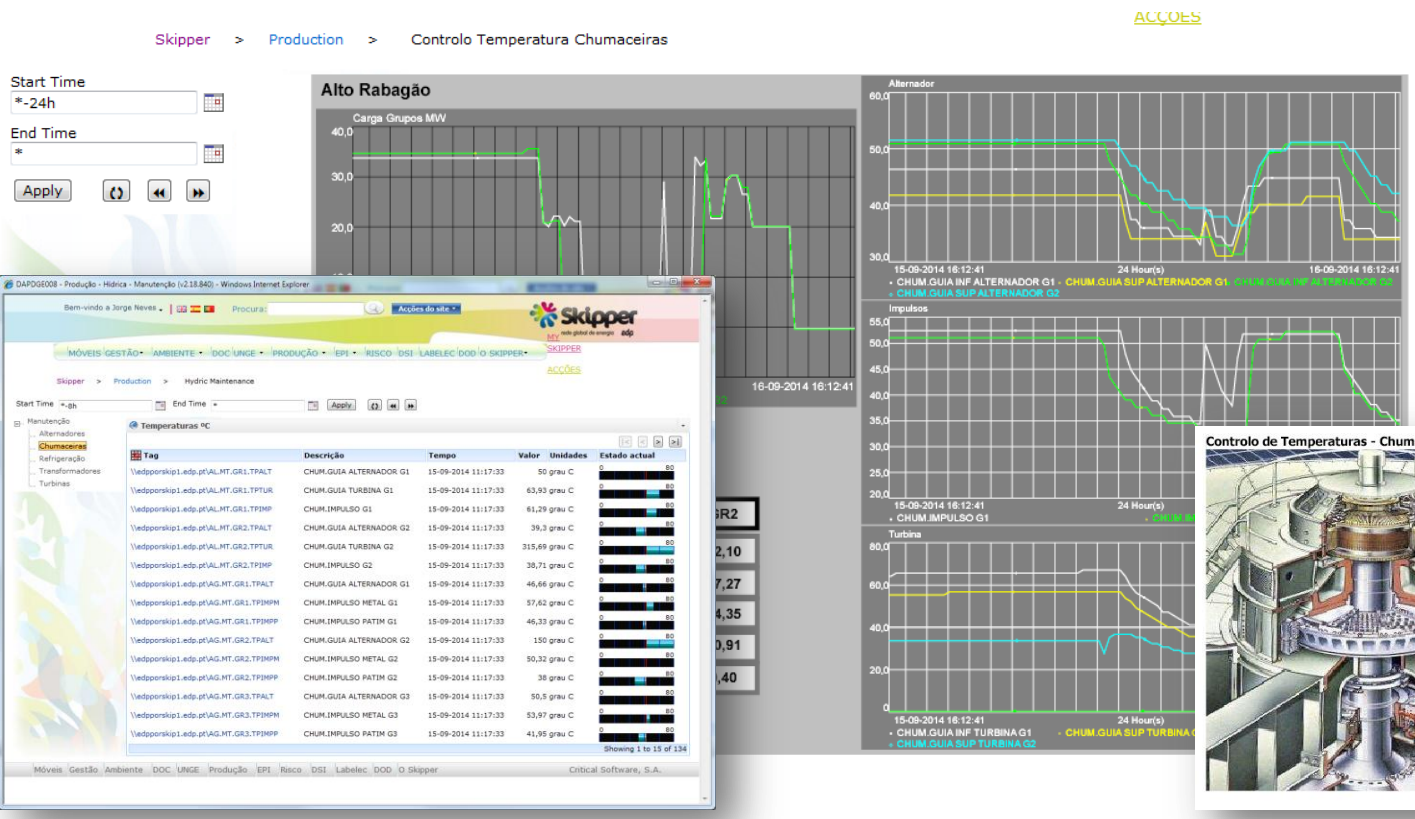


Thermodynamic cycle to control the degradation of operation.

Air and flue gas cycle control.

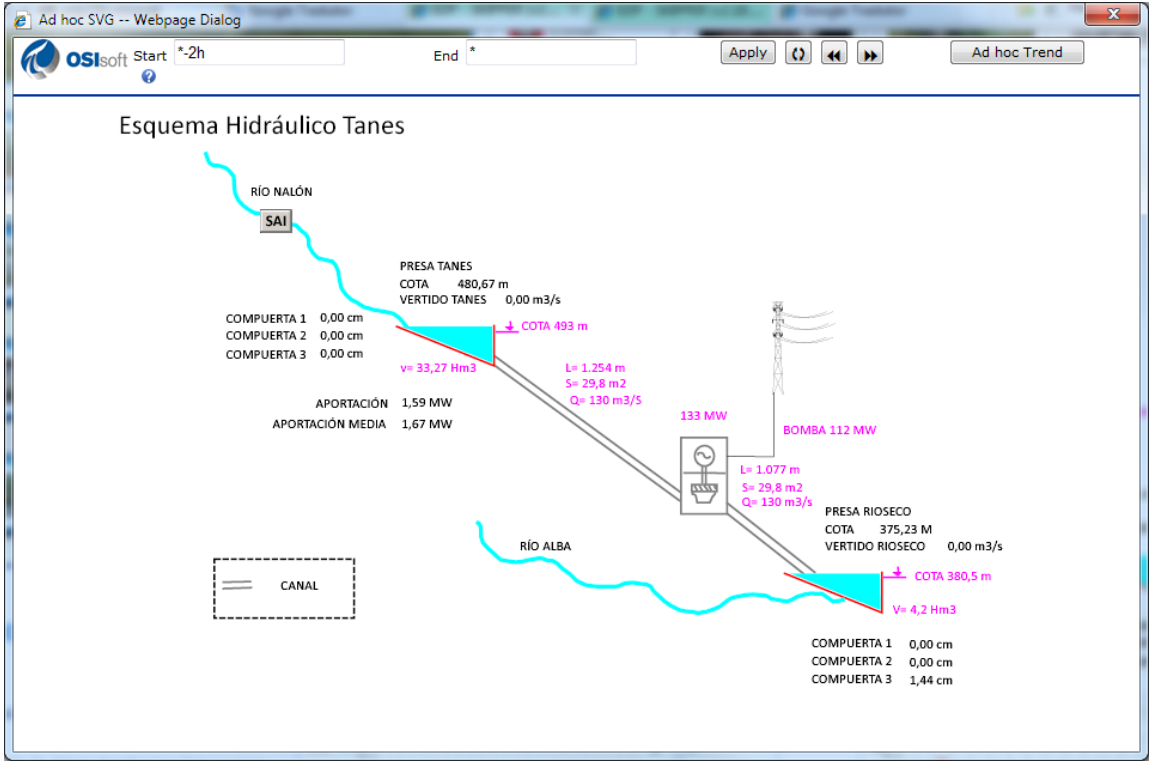
Water and steam cycle control.

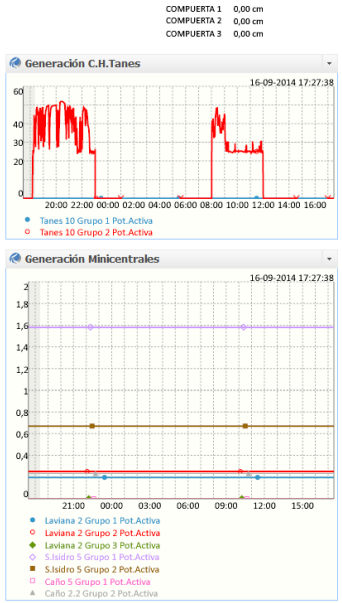
Maintenance



Turbo generator bearings temperature control, in Hydro power plants.

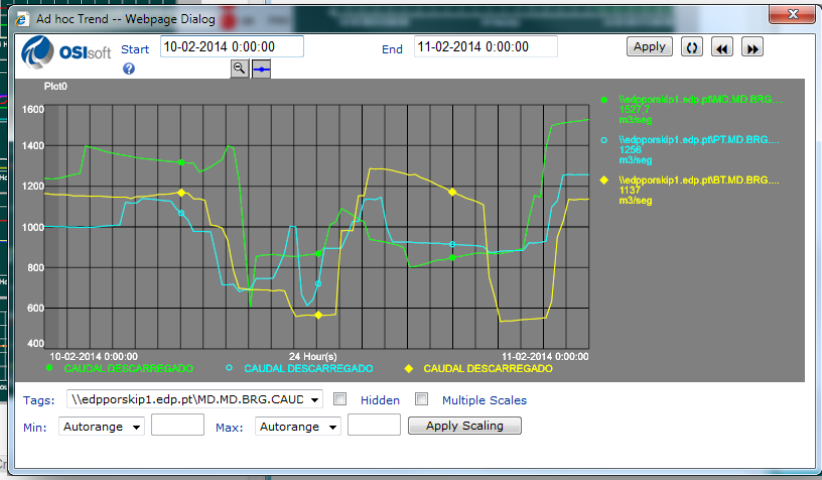
Operation





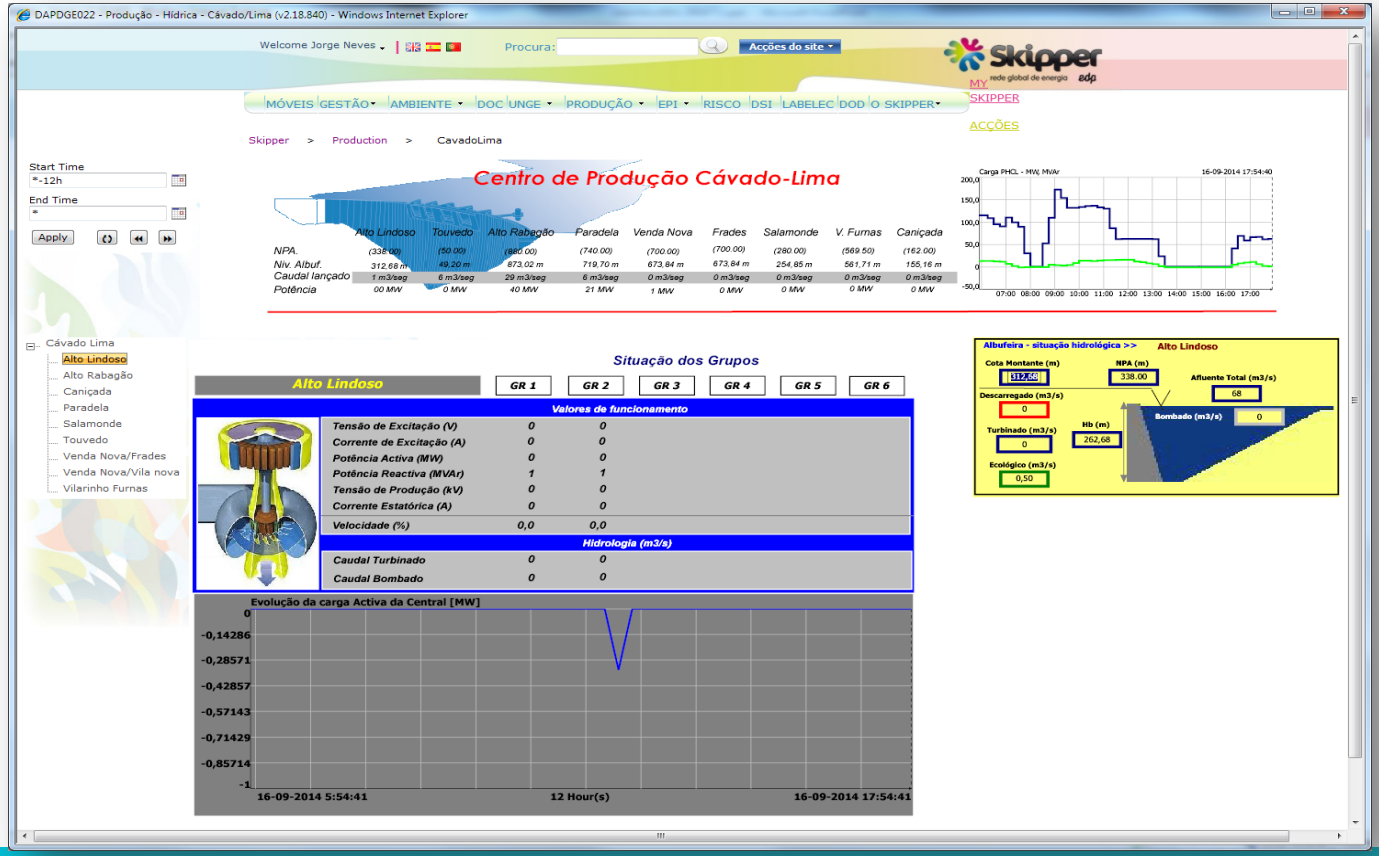
Hydraulic control and production in hydro plant.

Operation



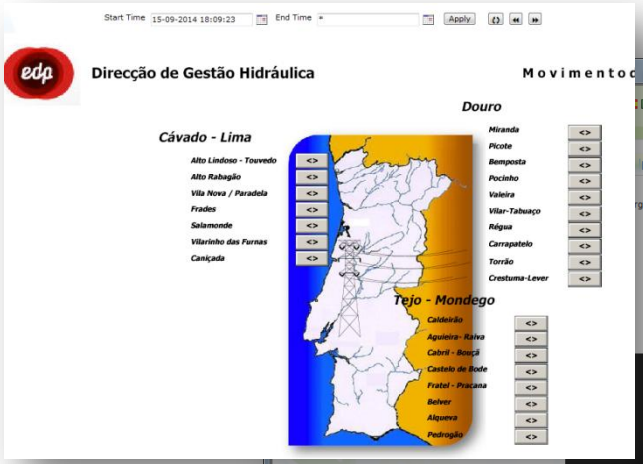
Dam overflow control.

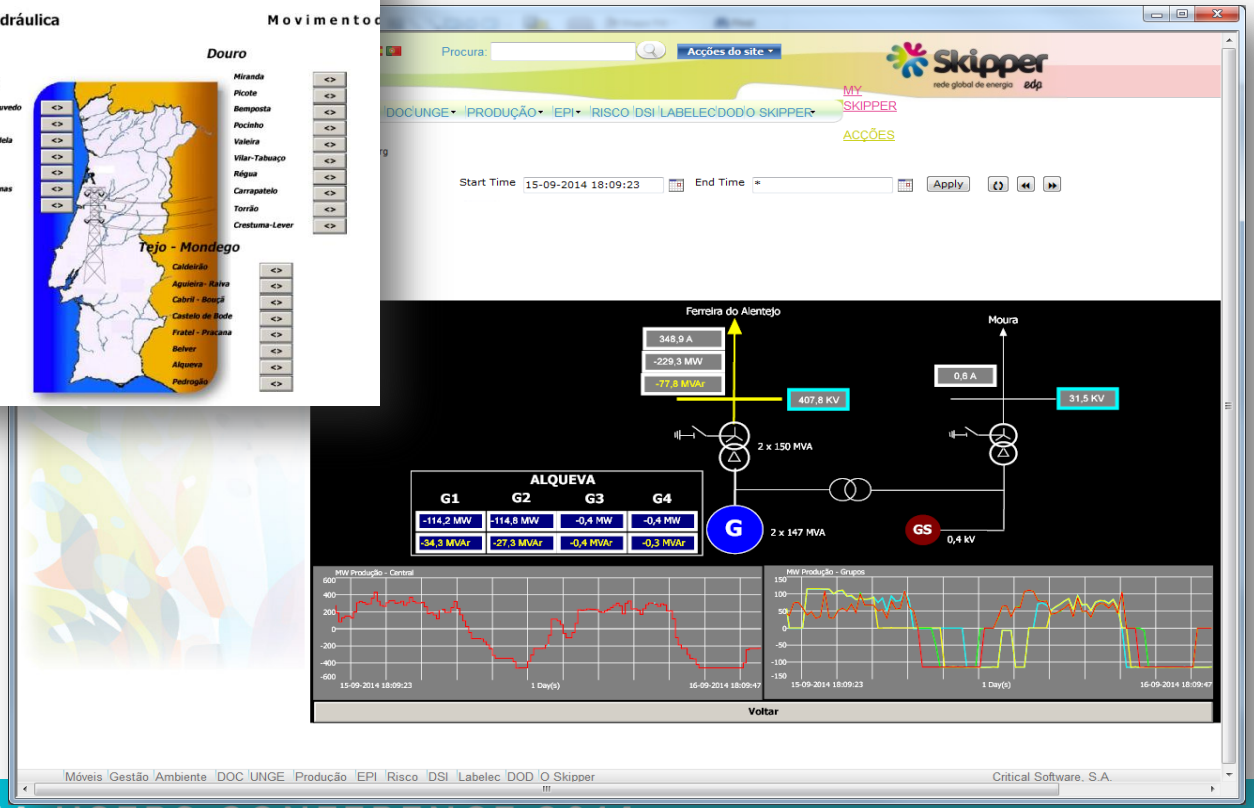
Operation



Monitoring the hydro systems.

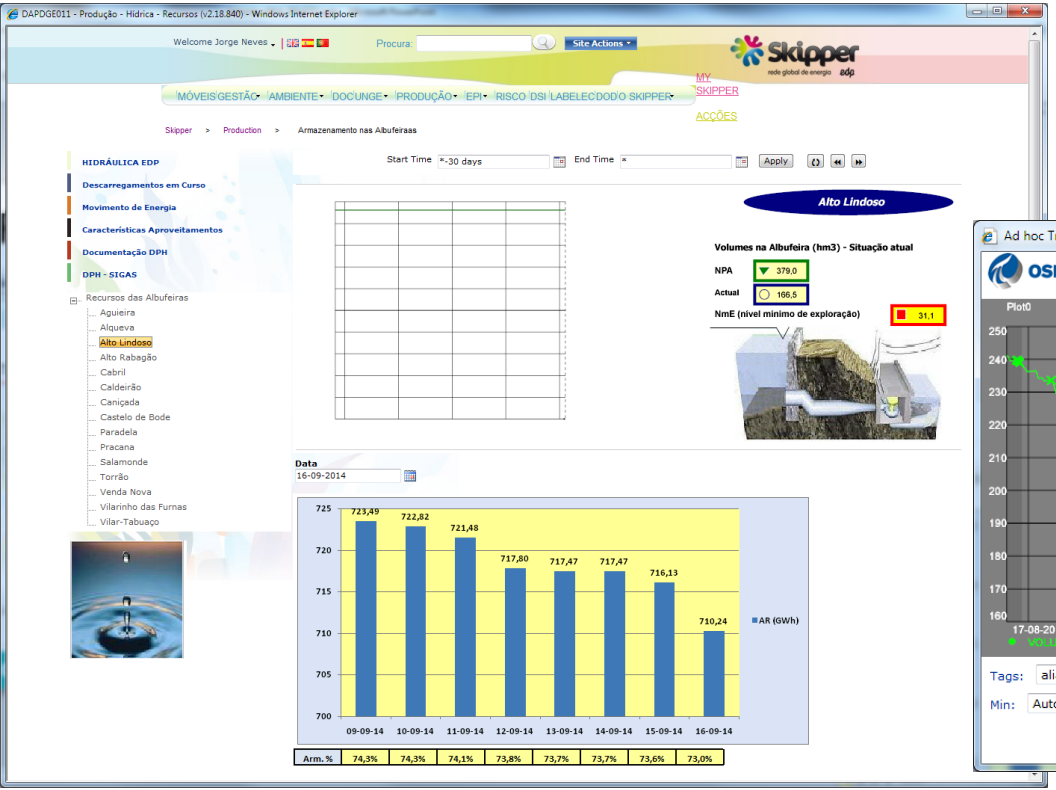
Operation





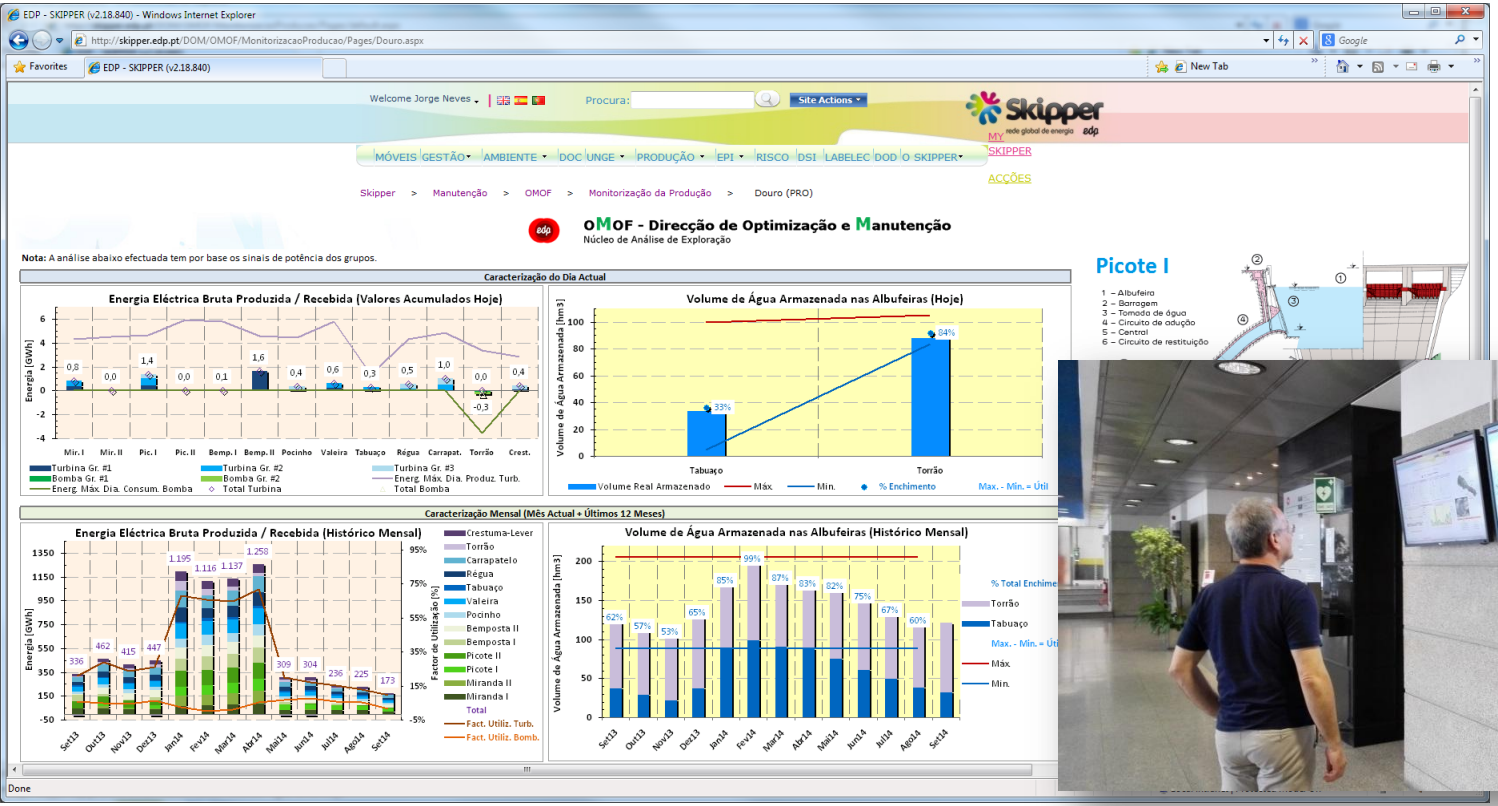
Monitoring the energy flow in hydro systems.

Operation



Control and monitor the capacity of the dams.

Information



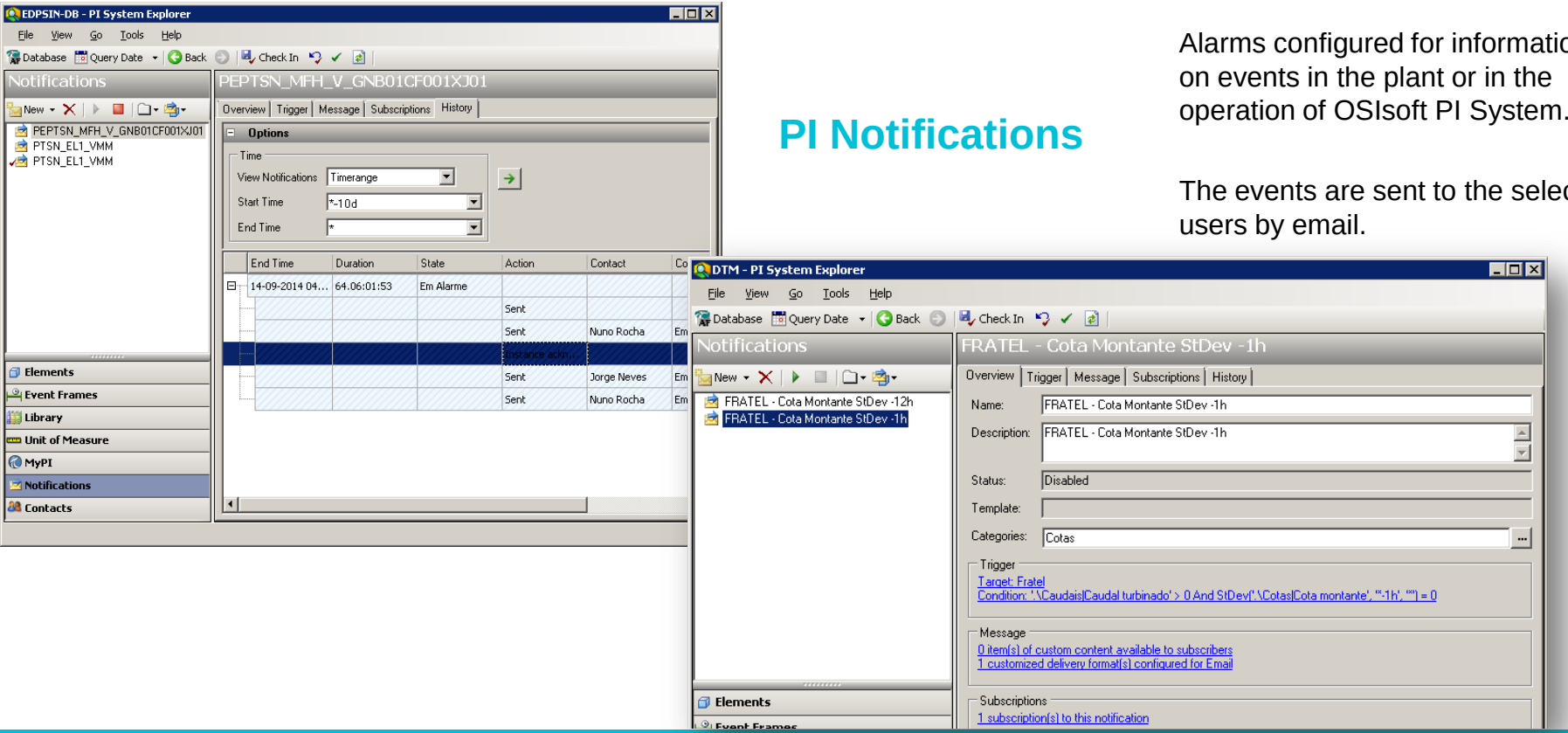
An infrastructure and a multitude of applications and presentations, flexible enough to any medium or target audience.

Alarms

PI Notifications

Alarms configured for information on events in the plant or in the operation of OSIsoft PI System.

The events are sent to the selected users by email.

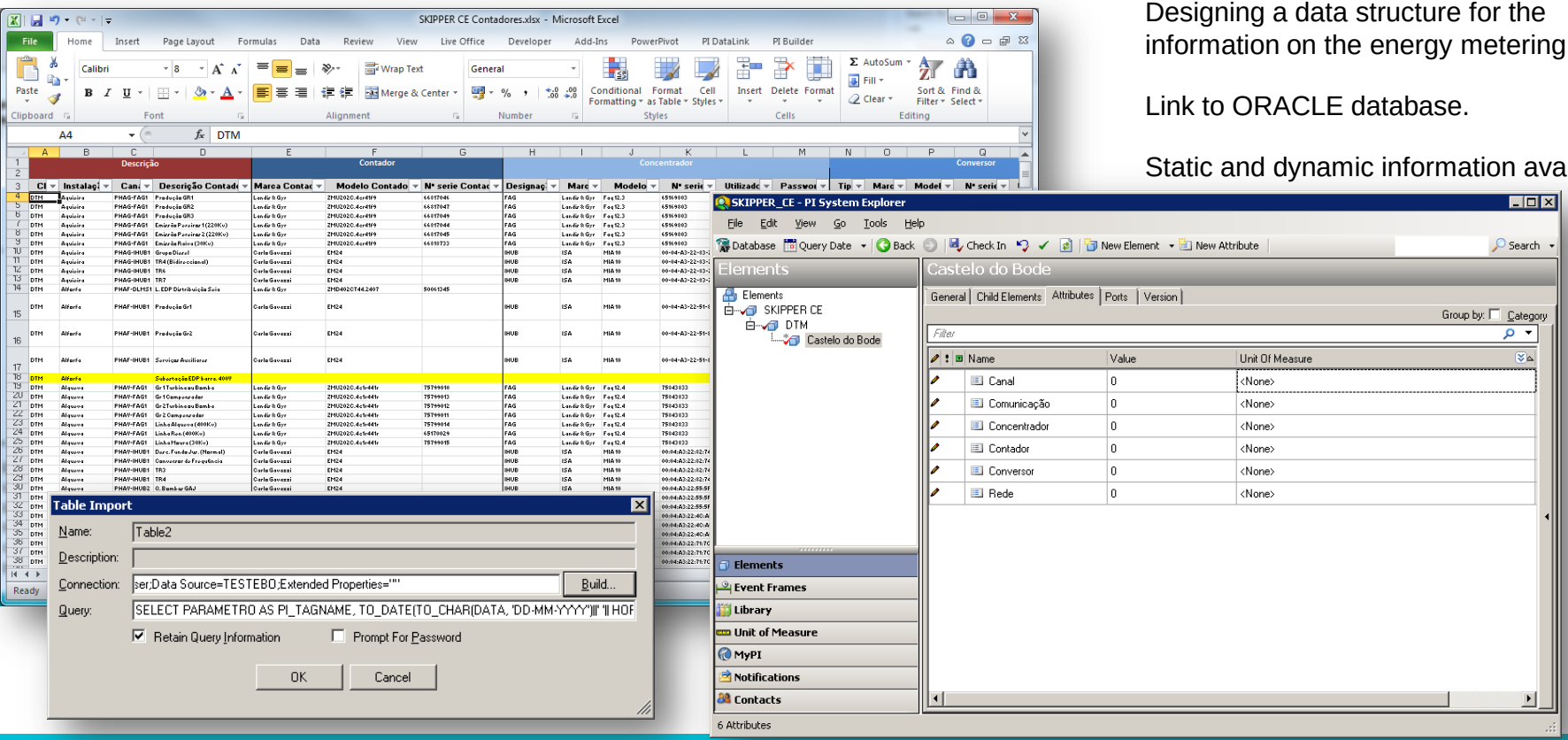


Work in progress

Designing a data structure for the information on the energy metering.

Link to ORACLE database.

Static and dynamic information available.



Conclusion

SKIPPER

State of the art

- Accessing to data and knowledge sharing without technological, organizational or geographical barriers.
- Putting the focus on the knowledge of the assets with the potential to create value by eliminating monopolies in data access.
- Evolve from a vertical organization to a networked organization.
- Obtain, maintain and analyze data from all units of EDP Produção.
- Optimize efficiency in the management of the existing assets.

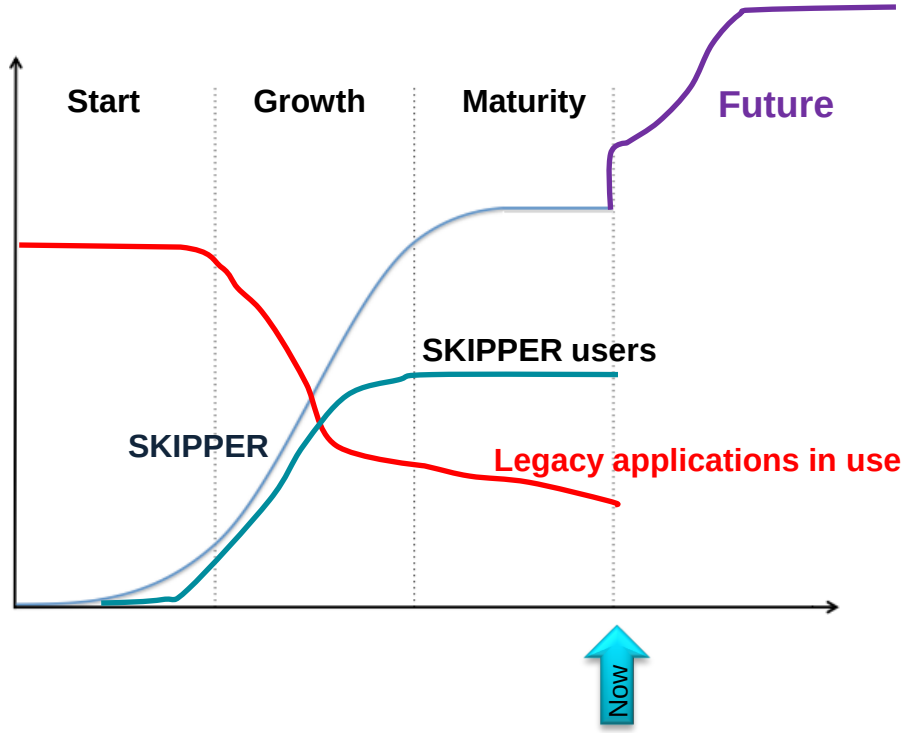
Time benefits

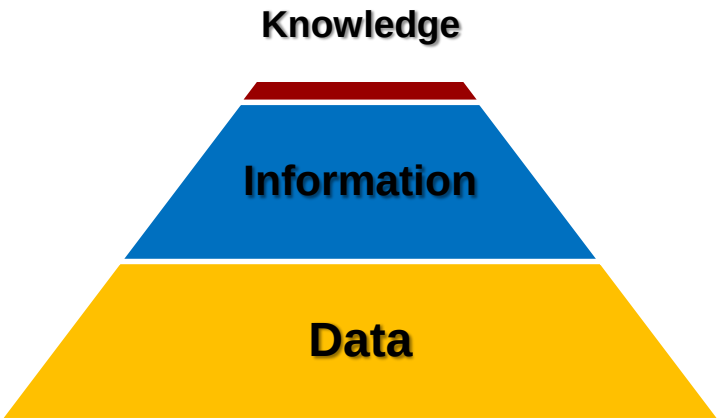
- Automation in the acquisition, validation and consolidation.
- Online access to data.

Economical Benefits

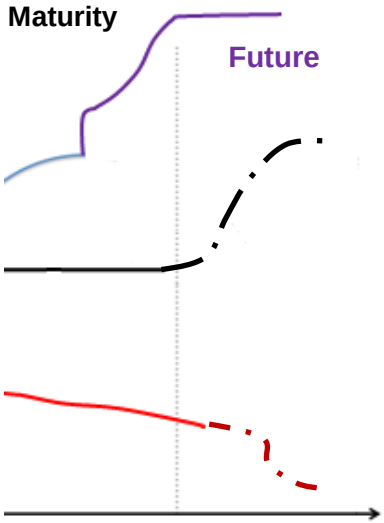
- Replacing the discontinued data acquisition systems – more economical maintenance and improved performance;
- Changes in operation, for example, reduction of reactive power in hydro production centres; Better thermal cycle performance with the control of the flue gas/air splitters in the boilers.

SKIPPER Lifecycle

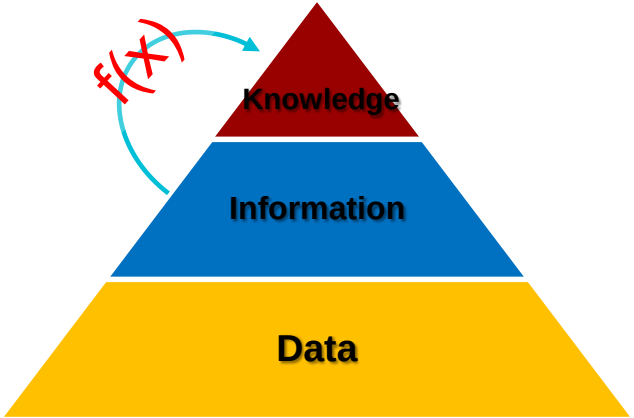




SKIPPER Future



New challenges
Uncertainties
Has risk
New learning curve



- **End legacy applications and integrate applications with same functionalities;**
- **Increase the number of SKIPPER users in maintenance areas;**
- **Ending the use of manual data entry;**
- **Predictive analytics;**
- **Optimization of access and sharing of knowledge;**
- **Establishing algorithms to transform the current information into knowledge.**

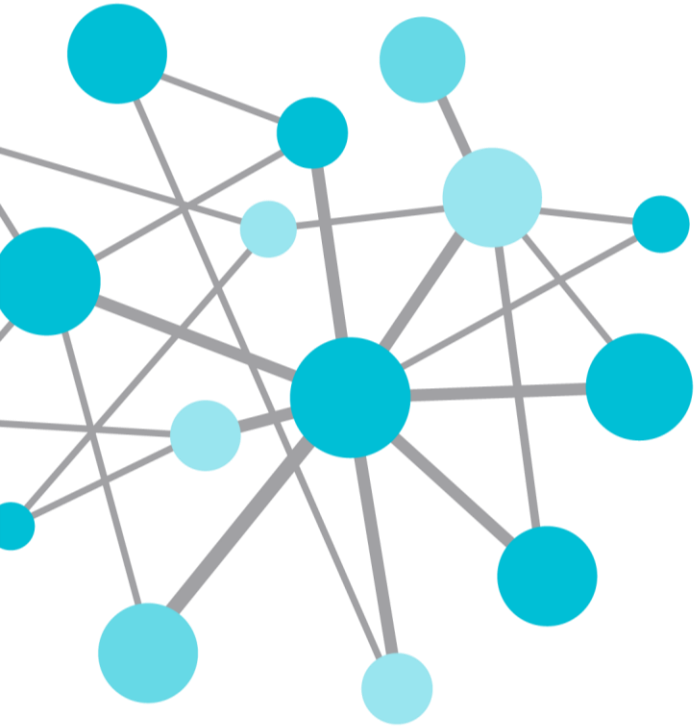
Jorge Neves

- jorge.neves@edp.pt
- EDP Gestão da produção de Energia, S. A.

Questions

Please wait for the **microphone** before asking your questions

State your **name & company**



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