REAL TIME PLANT DATA INTEGRATION - OSISOFT - PI PRACTICE

Indra in real time data world for Energy
The PI System is a reference in the industry as far as real time information management is concerned allowing optimal integration among Plant Control Systems and Management, Monitoring and Analytics Systems.

**Indra in the real time data world for energy**

**Main features:**
- Capacity for storage and gather huge amount of data. More than 2,000,000 values / second
- Several client applications for users: Web, Excel, etc.
- Worldwide leader (+ 14,000 implementations over 70 different countries; +50% of power generation companies in USA use PI)
- Different application sectors: Power Generation, Transmission, Distribution, Oil & Gas, etc.
- Plants / Process Operation Follow up. Control and monitoring systems are increasingly dependent on real time data
- Process Improvement. Improvements in plant / process operations require expert systems that help in the study and optimization of the processes
- Decision Making. Teams involved in management and decision making have to use the same reliable, available and updated data
- Historical: Analytics environment must be an open environment with well trained staff and capacity to manage large amounts of data
The PI Center of Excellence (CoE) is a PI platform knowledge center, composed by PI expert and IT expert consultants from various countries.

The main features of the PI Competence Center are:
- Consultants with expertise in OSIsoft implementations since the year 2000
- OSIsoft products consultants, experts in the development of interfaces, reports, graphs and applications
- Infrastructure experts
- Engineers with expertise in plant systems, experts in monitoring tools and process modeling (data reconciliation, etc.)
- System Integration of Process Control Systems, Plant Management and ERP
- Development of new Applications. Specific API from OSI Software to connect with Indra’s Plant Management Indra Solution

The PI Centers of Excellence are an integral part of Indra, developing strategies about PI System integrations that reflect specific regional requirements. The PI Centers of Excellence assist customers achieving higher value and benefits. The mission of Indra’s CoE is: “Providing services to PI for commercial and implementation purposes worldwide and transforming this experience into a worldwide network of Indra services”.

### Indra - OSIsoft Alliance

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>Indra’s first PI system project</td>
</tr>
<tr>
<td>01-07</td>
<td>PI Center of Excellence in Indra Spain</td>
</tr>
<tr>
<td>01-07</td>
<td>OSIsoft-Indra S.I. agreement signed</td>
</tr>
<tr>
<td>07-09</td>
<td>&gt; 20 PI systems projects</td>
</tr>
<tr>
<td>07-09</td>
<td>OSIsoft-Indra agreement upgraded</td>
</tr>
<tr>
<td>07-09</td>
<td>PI Center of Excellence in Indra Mexico</td>
</tr>
<tr>
<td>09-14</td>
<td>&gt; 40 PI Experts</td>
</tr>
<tr>
<td>09-14</td>
<td>8 PI Centers of Excellence worldwide</td>
</tr>
<tr>
<td>09-14</td>
<td>&gt; 25 customers</td>
</tr>
<tr>
<td>09-14</td>
<td>Strong LaTam commercial collaboration</td>
</tr>
<tr>
<td>09-14</td>
<td>East Africa VAR agreement</td>
</tr>
<tr>
<td>09-14</td>
<td>All PI systems Services provided (design, implementation, training, maintenance, etc.)</td>
</tr>
</tbody>
</table>

### Indra PI services - METHODOLOGY

#### Initial Analysis
- Collection of user requirements
- Definition of the PI platform architecture.
- Collection of technical information, and definition of the most appropriate architecture for the PI solution
- Solution design: licenses / components, configuration, interfaces and infrastructure

#### Implementation
- Database design, creation and configuration
- Installation and configuration of PI platform elements (servers, interfaces, etc.)
- Interfaces development
- Design and development of displays and reports
- Development functionality on - top – of the PI System
- Testing, Post-implementation support

#### Training
- Users training
- Administrators training

#### Documentation
- Definition of processes for the PI platform maintenance
- Reference manuals for final users. Quick guides

#### Solutions with Added Value
- Performance management simulators Development
- Predictive algorithms implementation
- KPIs development to help in decisions making
- Webportal development as a visualization tool to support business processes
More than 40 Indra PI Experts working in more than 20 customers in 4 continents

Integration with Plant Management Solutions

Over 140 energy companies and 700 plants around the world rely on our technology and solutions

Operation Support: Management of plant processes (log book, calculation of ratios and consumption, availability, outages management, incidences inventory, reports, etc.). It also includes connections with the generation dispatch and with the network operator.

Maintenance Management: Control over the follow-up of all actions carried out on the facility’s physical assets.

Fuel Management: Management of the entire fuel cycle in a generation plant.

Environmental Management: Integral control and follow-up of atmospheric pollution, fluids dumping and stocking of toxic and hazardous waste produced in the facilities.

Management of Inventory and Measures: Unification of all plant information and measures associated with it. It includes the integration of real time information management tools and the development of interfaces for data acquisition.

Dam Monitoring: Modeling and follow-up of the mechanical behavior of dams.

Technical Optimization: Integration of monitoring, analysis and process diagnosis tools.

Production planning and gas control of LNG plants.

Production Management

Fleet Mangement

Monitoring Center — Fleet Operations — KPIs Management

Plant Mangement


Facilities & Measurements Management

Plant Mangement

DCS Plant I&C — PI Real Time Plant Information — Performance Monitoring — Condition Monitoring

REAL TIME DATA INTEGRATION

Global reach, Indra PI Center of Excellence
Since the establishment of our partnership with OSIsoft, Indra has executed a substantial number of successful projects in the Americas, Europe and Asia.
Indra reserves the right to modify these specifications without prior notice.