DEXPI – Exchange of Semantic P&IDs with ISO15926

Update about the current activities and future plans of the plant lifecycle integration with ISO15926
Agenda

The P&ID exchange industry challenge
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The outcome & deliverables
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Data exchange in plant life cycle
A P&ID is the most important document in a process plant...
...BUT: There is NO existing standard for P&ID exchange
P&ID Information

Graphics

Lists

Structures
Therefore, P&IDs and P&ID information is now transferred as..
Loss of information during life cycle
Loss of information during life cycle

Quote: “To do data handover from design to operations in our last project - 100,000 man hours.”

Martin Rittmeister, October 2013
VP of Engineering @ Linde Engineering
The objective of the DEXPI initiative is to develop and promote a **standard for the exchange of P&ID’s**, covering the full lifecycle of a (petro-)chemical plant.
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 Coordination Requirements

 Implementation:
Proteus know-how
ISO knowledge
Interface building
Graphic exchange

 Conceptual model
Specifications
Validation / Verificator
DEXPI home page

 Model support
Model extension

 ISO Models

 Specifications

 Graphic exchange

 Software Requirements

 Conceptual model
Specifications
Validation / Verificator
DEXPI home page

 Model support
Model extension
DEXPI approach

Methodology: ISO 15926 + Proteus (XMpLant) scheme
All main CAE software vendors involved
Use existing standards (Do not re-invent the wheel)
Bottom up, pragmatic approach
International coverage, not only local
Do not re-invent the wheel...

DEXPI specification is based on international standards
Applicable for ANSI, IEC and DIN based P&IDs

<table>
<thead>
<tr>
<th>P&amp;ID standard</th>
<th>Instrumentation</th>
<th>Data Exchange</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO 10628</td>
<td>IEC 62424</td>
<td>ISO 15926</td>
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<tr>
<td></td>
<td>IEC 61987</td>
<td>Proteus</td>
</tr>
<tr>
<td></td>
<td>ANSI 5.1</td>
<td></td>
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<tr>
<td></td>
<td>DIN 19227</td>
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</table>
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Deliverables

1. DEXPI Specification for Exchange of PID(s) (Version 1.3)
2. Extension for the Proteus Scheme (resulting in Version 4.0.1)
3. Tools & Test cases
4. CAE Interfaces of the leading PID software (BETA)
DEXPI specification for PID exchange V1.2 - Available at DEXPI.ORG
Verificator - Available on DEXPI.ORG
Test cases
- Available on GitHub.com/DEXPI
### 3. DEXPI interfaces of CAE systems (BETA)

<table>
<thead>
<tr>
<th>CAE Vendor</th>
<th>Product</th>
<th>DEXPI Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autodesk</td>
<td>AutoCAD P&amp;ID 2018</td>
<td>Import &amp; Export</td>
</tr>
<tr>
<td>Aveva</td>
<td>Aveva PID</td>
<td>Import &amp; Export</td>
</tr>
<tr>
<td>Intergraph</td>
<td>SmartPlant PID</td>
<td>Export</td>
</tr>
<tr>
<td>Siemens</td>
<td>Comos PID</td>
<td>Import &amp; Export</td>
</tr>
<tr>
<td>VTT</td>
<td>Apros</td>
<td>Import</td>
</tr>
<tr>
<td>X-Visual</td>
<td>PID</td>
<td>Import</td>
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</tbody>
</table>
Autodesk
Current State of AutoCAD P&ID DEXPI interface
Aveva
Current State of Aveva P&ID DEXPI interface
Intergraph
Current State of SmartPlant P&ID DEXPI interface
Siemens
Current State of Comos P&ID DEXPI interface
VTT import
Current State of APROS DEXPI interface

Apros

From DEXPI P&ID to dynamic simulation
X-Visual
Current State of x-Visual P&ID DEXPI interface
BETA testing in progress

<table>
<thead>
<tr>
<th>O/O EPC</th>
<th>Tool 1 (Vendor)</th>
<th>Direction</th>
<th>Tool 2 (Vendor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Liquide</td>
<td>SP P&amp;ID (Intergraph)</td>
<td>→</td>
<td>AutoCAD P&amp;ID (Autodesk)</td>
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<tr>
<td>BASF</td>
<td>AutoCAD P&amp;ID (Autodesk)</td>
<td>↔</td>
<td>Comos P&amp;ID (Siemens)</td>
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<tr>
<td>Evonik</td>
<td>SP P&amp;ID (Intergraph)</td>
<td>→</td>
<td>Comos P&amp;ID (Siemens)</td>
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Usage of DEXPI.org

<table>
<thead>
<tr>
<th>Country</th>
<th>Usage</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Germany</td>
<td>912</td>
<td>43.53%</td>
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<tr>
<td>Finland</td>
<td>345</td>
<td>16.47%</td>
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<tr>
<td>United States</td>
<td>186</td>
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<tr>
<td>United Kingdom</td>
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<tr>
<td>Netherlands</td>
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<td>3.77%</td>
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<tr>
<td>Brazil</td>
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<td>1.91%</td>
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<tr>
<td>France</td>
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<tr>
<td>Austria</td>
<td>25</td>
<td>1.19%</td>
</tr>
</tbody>
</table>

Flatech 2017 Technology Conference & Showcase
DEXPI’s Influence and cooperation
DEXPI is used in other standards and projects

- OPC – Signature at Hannover fair
- Mimosa - OIIE
- Namur – NE159
- Input für ENPRO
Collaboration with OPC UA

April 24th Public signature @ Hannover Fair

Link between PLCopen and OPC UA

- PLCopen TC4 transparent communication using OPC UA
  - OPC-UA client function block library
  - PLCopen XML is now supported by OPC UA

http://www.plcopen.org/
Collaboration with **Mimosa** / OIIE

DEXPI as P&ID exchange standard
NAMUR uses DEXPI as standard for transmitting P&ID
ENPRO – Energy Efficiency and Process Intensification for the Chemical Industry

Prerequisite for stable, cost-efficient and innovative software that uses existing information in an optimal way!

- Rates and properties
- Topology 2D
- Topology 3D
- Process simulation
- DEXPI P&ID Model
- 3D Model
- Process data
- Manufacturer data
- Maintenance data
- PIMS
- Data bases/portals
- Data bases/portals
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We want you!

Owners

EPC’s

CAE vendors
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