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White paper

Data exchange with ISO 15926 – A way to improve doing business

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DEXPI, a working party of ProcessNet[2] Section „Process, Apparatus and Plant Technology“

Motivation

Due to the lack of interoperability between CAE (and other) systems companies today face high efforts in data exchange while working together to execute projects for planning, construction and operation of process plants. Parties typically exchanging data in such projects are e.g. EP/EPCs, owner-operators, and vendors, but also site services and authorities. One of the main reasons for this high effort is the lack of an agreed understanding across the different systems, e.g. by means of a commonly used standard for data exchange within the process industry. To become more efficient during planning, construction and operation of plants, a data exchange model based on the ISO 15926 standard shall be established.

Objectives

The objective is to develop and promote a general standard for the process industry covering all phases of the lifecycle of a (petro-)chemical plant, ranging from specification of functional requirements to assets in operation. This standard shall cover formats and content to address various problems seen today:

- Avoid format conversions (and thereby data loss) when passing engineering data and documents across CAE system boundaries.
- Make handover of engineering data during and at the end of a project easy and cost-effective.
- Reduce data exchange barriers between different CAE systems or different customizations of the same CAE systems. Support long-term storage of plant data in a CAE system independent format. Today’s commonly used standard formats like PDF don’t support value added improvements or at best insufficiently.
- Simplify co-existence of different CAE systems within a company, e.g. due to mergers/acquisitions or different priorities in different business units.

Expectations

EP/EPCs, suppliers and owner operators want to minimize the cost for handling engineering data during planning, construction and operation of process plants between different CAE systems and they want to create opportunities for new value-added functions base on the available engineering data.

Therefore the CAE vendors will implement a valid global standard for data exchange into their CAE systems. In a first phase, data exchange will cover graphics, topology of the full P&ID and attributes of the discrete P&ID components.

[1] DEXPI – **D**ata **Ex**change in the **P**rocess **I**ndustry
[2] ProcessNet - A Joint initiative of DECHEMA and GVC/VDI

The involved owner/operator companies from the DEXPI working group will define a common data model which is based on the ISO 15926 standard. The resulting data model will be aligned with other projects in the global ISO 15926 community, e.g. within Fiatech. The CAE vendors will implement this common data model as the basis for data exchange and will deliver it as part of their default system configuration. In addition, it is expected that CAE vendors agree on a common exchange format for the graphical representation of a P&ID and implement the result in their systems as well.

The involved companies expect a constructive team work of the CAE vendors during the definition of the common ISO 15926 conformant data model.

Tasks

Objective of the first phase of the initiative is the transfer of a P&ID from one P&ID system to another P&ID system. The data transfer must include graphics, symbols, topology, all engineering attributes, enumerations, select lists etc. to enable seamless continuation of work on the P&ID in the destination system.

Transfer of engineering data over the full life cycle of a plant between different CAE tools e.g. from simulation to basic/detail engineering up to operations and maintenance may be covered in subsequent phases.

Scope

The definition of the data model and the implementation should be based on ISO 15926, preferably parts 2, 3, 4, and 7.

Phase 1 – P&ID transfer[3]

P&ID

- Transfer of graphic including topology, all metadata and master data of a P&ID

Mechanical Equipment

- Transfer the basic equipment data, this covers the content of the equipment list on the P&ID

Phase 2 – Engineering Data transfer

Mechanical Equipment

- Transfer of equipment data sheets including master data (material, etc.)

E&I

- Transfer of the instrument index with all major attributes and requirements from process
- Transfer of master data
- Transfer of technical data sheets
- Transfer of all diagrams while maintaining the links to the instrument data

Piping

- Transfer of the pipe service index and stream data

[3] Transfer means data exchange between two different CAE systems.

Timeschedule

P&ID and engineering data transfer:

2012 – first prototype for P&ID export and import, modeling of some P&ID classes including equipment, E&I and piping objects.

2013 – extension of the P&ID export and import for a complete P&ID, modeling of all P&ID classes (equipment, E&I and piping), objects and attributes for the entire plant lifecycle

2014 – first (beta) version of P&ID export and import, modeling of all classes (equipment, E&I and piping), objects and attributes for the entire plant lifecycle, first released DEXPI ISO 15926 data model

2015 –production ready version of P&ID export and import and production ready interface for engineering data exchange for the entire plant lifecycle, both based on the DEXPI ISO 15926 data model