INDUSTRIAL INTEROPERABILITY CURRENT SITUATION AT PREEM

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Agenda

Short intro to Preem production sites and PLM/ALM-system
Project setup (normal and EPC)
Some example of projects and how we have worked with documentation
Project log tool
Learnings
Other challenges/possibilities

Short info about Preem

2 Oil refineries (start of production about 1967 and 1974) about 900 employees ,
100 FTE engineering contractors and 200 entrepreneurs
(7st Preem owned product depots)

SmarTeam from Dassault as technical asset lifecycle management (ALM/PLM):
*Plant hierarchy (200 000 placements/functional locations)
*Plant documentation (800 000 documents)
*Project documentation

Maximo from IBM as maintenance system (plant hierarchy through integration
from SmarTeam)

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Organizations and project models

Normal project
<30MUSD maintain and develop
current facilities
Project department responsible for
project and EPC
Cooperate with suppliers

Autodesk 2D and plant 3D with
integration to SmarTeam and Maximo
Tekla (steel structures)
3D laser scanning in many projects

Large project
>30MUSD new facilities (units)

Small Preem organization responsible for project
EPC contractor

PDMS from Aveva for 3D design (so far)

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Example of large projects with EPC-contracts

GOP-project
Project started about 2005
All documents delivered at DVD just before project closed
Resources in line organization that not were involved in project worked with storing documentation in ALM-system

Problem:
*$2M for documents storing not enough for take care of all documentation
*Many documents not stored or not correct connected to FLOC in ALM-system
*Time consuming

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Example of large projects with EPC-contracts

VDU-project (about $170M)
Project started about 2014
Documentation plan setup early
Documentation requirement specification
New developed IT-system Project log
Dedicated documentation engineers at Preem

Problem:
*Documentation engineers need to spend lot of time to correct wrong document
*Supplier and other companies that EPC-contractor used did not always follow
Preem requirement

Example of large projects with EPC-contracts

HPU-project (about $70M)
Project started about 2015
Documentation plan introduced later in project
New developed IT-system Project log introduced later in project
Part time documentation engineer at Preem
Documentation requirement specification introduced later in project

Problem:
*Documentation engineers need to spend lot of time to correct wrong document
*Supplier and other companies that EPC-contractor used did not always follow Preem requirement
*EPC-contract did not cover how to handover documentation
*Responsible for documentation from EPC contractor had not enough mandate in company

Project log etc.

Project log (Preem developed tool with integration to SmarTeam)
Review and store documentation (project and plant) in SmarTeam
Mail conversation between Preem and EPC

Pro:
All documents stored in ALM-system during project
Review functionality for project team
EPC do not need to access SmarTeam direct

Cons:
The requirement don´t follow any standard
Takes lot of start up time before all involved deliver according to the requirement

Separate handling:
Data (meta data) that shall be stored in SmarTeam DB are entered in Excel sheet
by EPC-company and imported by IT to SmarTeam

Learnings

1. Documentation plan setup early (which documents, review level, template etc)
2. Documentation requirement specification part of agreement
3. IT-system for handle documentation to our ALM-system and email is needed
4. Dedicated documentation engineers
5. Tool for import of data to ALM-system that not require IT-resources

It probably requires more time and effort for the EPC companies to follow Preem requirement and use Preem unique setups vs if we used common standard that EPC and ALM/PLM-system support

Other challenges/possibilities

The EPC-contractor normally deliver a large model (as PDMS) and 2D-drawings as required by Preem.
We see two major challenges:
*Difficult to find engineers with PDMS experience
*We have not found any process to maintain and develop model then we several ongoing parallel projects in different phases at same time

Consequence:
Design re-start with new 3D-models in Plant 3D or Tekla and use new performed laser scanning as input, even if we have the original design in 3D.

Future:
Digital twin
Connect ALM-system, maintenance system and process control system