Efficient business communication with ISO 15926 - a Lingua Franca

Dr. Thore Langeland, Chairman of PCA
POSC Caesar Association (PCA)

- PCA was established in 1997

- In 1997 PCA initiated:
  
  ISO 15926 “Integration of life-cycle data for process plants including oil and gas production facilities”.

- PCA has focus on the development, maintenance and enhancement ISO 15926

- PCA has 35 members from eight different countries.

Standards and specifications across E&P value chain

PCA’s global Reference Data Service (RDS)

Contains dictionaries, taxonomies and ontologies for relevant business processes in oil and gas

Data integration across E&P value chain with ISO 15926 creating an Oil and Gas Ontology

PCA collaborates with other standardization organizations
Members of PCA providing solutions based on ISO 15926 technology

- AVEVA
- Bentley
- EPM
- Epsis
- Eurostep
- IBM
- Innotec
- Intergraph
- Invenia
- Noumenon Consulting
- Octaga
- Tektonisk (ShareCat)

Bentley’s stand at daratechPLANT 2008

Bentley Systems has released OpenPlant software products for the creation and management of plant infrastructure based on the ISO 15926 data model.

Bentley, January, 2008
Integrated Operations (IO)
Access to information change the Norwegian offshore industry

- IO is access to information in real time
- IO is safer, faster and better decisions
- IO has a potential of NOK 300 billions on the NCS
Integrated Operations (IO)

Generation 1 and 2

Potential

Integration across companies

Integration across onshore and offshore

Limited integration

Traditional processes
- Self-sustainable fields
- Specialized onshore units
- Periodic onshore support

Generation 1
- Integrated onshore and offshore centers
- Continuous onshore support

Generation 2
- Integrated operation centers of operators and vendors
- Heavily automated processes
- 24/7 operation

IO has a potential of NOK 300 billions on the NCS
Deployment of RFID

- Industry needs
- RFID applications/systems areas
  - Personnel
  - Container
  - Drilling pipes
  - Mobile equipment
  - Fixed equipment

- Functionality description
- Interoperability
- Open for future technological developments
Information security
OLF’s Information Strategy

An efficient pipeline for real-time data transferal and analysis

Smarter solutions

Field data
- Health, safety, environment
- Seismic
- Drilling & Completion
- Reservoir & production
- Operation & maintenance
- Logistics
- Transportation

XML schemas

Semantic Web
- Infrastructure for web services
- Oil & Gas Ontology (ISO 15926)¹

Smarter data

1) Ontology = A hierarchical data structure containing concepts, relationships, properties and rules for a specific domain
Integrated Operations

- Analysis
- Visualisation
- Knowledge
- Decisions
- Actions

Real Time Data

Data Integration (ISO 15926)

Operation Centre
Data integration

ISO 15926 is an instrument for data integration that provides interoperability\(^1\)

Some engineering company call ISO 15926 for Lingua Franca\(^2\)

Data integration across E&P creates an oil & gas ontology:

- **HSE**
  - Yearly report on emissions and discharges
- **Development**
  - 2/3D exchange between systems
  - Data sheets
- **Drilling**
  - Daily drilling report
- **Production**
  - Daily production report (Basis for PRODML)
  - Monthly production report
- **Operation**
  - Integrating MES and ERP
  - Condition based monitoring (CBM)

\(^1\)Interoperability = The ability of two or more systems or components to exchange information and to use the information that has been exchanged.

\(^2\)Lingua Franca = A common language used for business purpose by traders in eastern Mediterranean in Middle Ages
Today’s Data Architecture

5. END-USER APPLICATIONS

- Historian driven Processes
  - Monitoring processes
  - Monitoring facilities
  - Monitoring equipment
  - Simulation of processes
  - HSE

- Enterprise applications
  - ERP systems
  - CRM systems
  - Engineering Systems
  - Communication and collaboration systems

- E&P applications
  - Well planning and evaluation
  - Geologic modeling
  - Reservoir modeling
  - Production optimization
  - Visualization

3. PROCESS CONTROL DOMAIN

- Historian Embedded Processes
  - Process control
  - Performance indicators
  - Events and alarms

- Dedicated communication buses and proprietary protocols
  - SCADA & DCS
  - Control Systems

2. DATA SOURCES

- Operation & Maintenance
  - Emissions
  - Discharges
  - Incidents
  - IS Events
  - Tracking

- Production
  - BHTP
  - DTS
  - DHFC
  - Flow

- Drilling
  - MWD
  - LWD
  - Tracking

- Drilling (Exploration)
  - MWD
  - LWD
  - EM

- Seismic
  - 4D
  - E&P

- Logistics
  - Tracking
  - Inventory

- Transport
  - Facilities
  - Flow
  - Chemicals

1. DATA SOURCES

- HSSE
  - Emissions
  - Discharges
  - Incidents
  - IS Events
  - Tracking

- Fire wall

- Ethernet (TCP/IP) based protocols
  - (e.g. OPC UA)

- (only one way)

- (e.g. WITSML / PRODML)
The current IT Architecture
Future Service Oriented IT Architecture

- Drilling and Completion
- Reservoir and Production Management
- Operations and Maintenance
- Enterprise’

Enterprise Service Bus

Services integration

Communication and Information Security

- DCS, PLC & Historians
- Rotating Equipment Monitoring
- Facility Monitoring and MES
- Engineering Systems
- Maintenance & Asset Management
- Equipment and Process Documentation

NEW UPSTREAM APPLICATIONS

Oil & Gas Ontology

EXISTING APPLICATIONS & INFORMATION REPOSITORIES
All meta data in the XML schemas should be structured according to ISO 15926 and become a part of the oil & gas ontology.
StatoilHydro
Information from plant to office

Smart Web Services

Common XML schemas
Drilling/wells, Reservoir and Production,
Operation and Maintenance

Semantic web
Intelligent data
ISO 15926
O&G ontologies

Vendor

StatoilHydro

Vendor
Integrated operations: Collaboration across all boundaries
Vision: Networking competences globally
Ambition;

the IO leader by networking competences globally

All fields and facilities are IO compliant
Develop a global competence network leveraging IO
Remove boundaries with IO
Realize the potential from R&D projects in our operations
a revolution in our way of working...

- collaboration
- standardization of work processes
- way of working in each asset
- way of working across assets

across-company collaboration

StatoilHydro
Integrated Operations - IO Compliance

Skills and competences

IO Compliance

Common working practices and tools

Work processes

ICT Solutions
Summing up

A lot is going on in the community of POSC Caesar Association.

Be involved and become a member of PCA!
PCA’s Member Meetings

February  
May  
October

Please, become a member of PCA and support enhancement of ISO 15926
Thank you!