PCA Update
Reference Data for the Oil and Gas Industry

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Points of intersection

- Data in Motion
- Data at Rest
- Spatial Data
- eBusiness
- Advocacy
- OGP
- Life Cycle Facility Mgmt
- Communic Protocols
- Reference data
- Pipelines
- Seismic
Reference Data Complexity

• Dictionary
  – Terms and definitions

• Taxonomy
  – Classes in sub-/super-class hierarchy

• Ontology
  – Constraints
  – Connections

Decrease of ambiguity
ISO15926 interoperability at its simplest

Using *standard shared references* reduces business ambiguity & reduces mapping overheads.
Makes interoperability easier and reduces risk & cost
**PCA-MIMOSA Information Content Dimension**

- **Domain Specific Nomenclatures**
  - Health, Safety & Environment
  - Drilling & Completion
  - Design & Engineering
  - Reservoir & Production
  - Operations & Maintenance
  - Logistics & Transportation

- **ISO 15926 Data Model**
  - Thing
    - Class
    - PossibleIndividual
    - ClassOfClass
    - ClassOfIndividual
    - ClassOfRelationship

- **PCA (Oil & Gas & Process Industry Ontologies and Reference Data)**

  - Structure and add to PCA Reference Data Library (RDL)
  - Determine entity type
  - Determine specialization and other relationships

**Reference Architecture Dimensions**
- Business Context (Lifecycle Placement)
- Information Content Knowledge Domain
- Technology Configuration (Automation Level)
ISO 15926 Reference data architecture

- Standardization
- Change Requests
- PCA RDL
- Reference / Synchronize
- ISO RDL
- Reference / Synchronize
- PCA RDL
- Change Requests
- Feed Back
- Capital Project and Operations & Maintenance

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PCA Products and Services

- PCA Reference Data Library (RDL)
  - Developing, maintaining and enhancing reference data for oil and gas and other business domains

- iRING
  - A solution architecture and best practices for achieving global information interoperability based on ISO 15926 and the PCA RDL

- Testing of standards based interoperability
  - The Oil and Gas Interoperability initiative and the JORD project will provide testing and compliance specifications and procedures for ISO 15926
Oil and Gas Interoperability (OGI)

Reference Information Environment

Semantic Context

Execution Environment “P2B Stack”

Enterprise Business Systems

ISO 15926

Engineering & Construction

PCA

RDL/Ontology

Transform Engine

Information Service Bus

ISO 18435

MIMOSA

O&M Requirements Repository

Registry

ISO 13374

Controls

Physical Assets

ISO TC 184
The JORD Project

Architecturally Peer-to-Peer (Internet Federation)

JORD enhanced PCA RDS in partnership with FIATECH
- **JORD Scope:**
  - Methodology for Compliance Assessment
  - Services Platform & Publishing Tools
  - Instruction, Consulting & Training Resources
  - Services Organization & Business Resources

- **Project duration:**
  - Phase 1: May 2011 – October 2012
  - Phase 2: November 2012 – June 2014
  - **Phase 3: July 2014 –**

- **Deliverables:**
  - Every 6 months

- **Participants:**
  - Phase 1 & 2: Dow, EPIM, RosEnergoAtom, Woodside, Bechtel, Black & Veatch, CCC, Emerson, Hatch and VNIIAES

- **Phase 3 are in planning:**
  - Enhancements and improvements of reference data and templates and support and training will be the main tasks
  - Interest from software vendors, additional Owners/Operators EPCs and Control System companies
Integrated Lifecycle Assets Planning (ILAP)

- The Integrated Lifecycle Assets Planning (ILAP) standard is a common planning standard for the oil and gas industry for exchange and sharing of planning data across all phases of the assets between relevant stakeholders.
- ILAP drives information quality and supports high quality planning

ILAP shall cover planning activities for:

- **Assets management** - lifecycle value optimization for physical assets (ISO 55000)
- **Project management** – planning of projects in all asset lifecycle phases (ISO 21500)
- **Adapted for use in the oil & gas industry**
- **Integrated and modeled for interoperability** (machine readability – ISO 15926)
ILAP Asset Lifecycle Model

Asset Lifecycle Activities

- **Acquire**
- **Develop**
- **Operate* and maintain and renew**
- **Dispose**

*Incl. drilling
**Incl. Turnarounds and High Activity Periods

*Governance*

- **Go/no go decision**
- **Study**
- **Modification project**
- **Greenfield development project**
- **Brownfield redevelopment project**
- **Disposal project**

Governing, timing and classification of Asset Lifecycle Projects
EPIM’s Hubs solutions are based on ISO 15926 and PCA’s Reference Data

EPIM EnvironmentHub (HSSE)
EPIM ReportingHub (E&P)
EPIM EqHub (SCM)
EPIM LogisticsHub (SCM)
EPIM PlanningHub (Asset Management)

Common Reference Data (PCA)
GIM (ISO 15926)
RDF/OWL & SPARQL (W3C)
XML/XSD (W3C)
Internet VPN (SOIL)
Holistic view on the Reference Architecture

GIM - Generic Information Modelling
- ISO 15926 Integrated Life-Cycle Data
RD = Reference Data
PERA = Purdue Enterprise Reference Architecture
PEAM = PISTEP Engineering Activity Model

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Conclusions and Recommendations
Defining and implementing standards for effective data management

• Digitalization of the Oil & Gas industry
  – Digital fields are a reality
  – Digitalization in other areas have been ongoing for a long time

• Effective standards based interoperability solutions are being developed and implemented

• Use open standards (ISO, IEC, W3C --)

• Make the standards interoperate – Don’t create new standards where standards already exists

• Integrate data not systems --- Systems must interoperate without systems integration ---