



Meeting AFNOR

25 Sep 2015

Echanges de données avec la norme ISO 15926 : Mises en œuvre françaises, REX et enjeux internationaux pour l'énergie et les industries de procédés.

USPI, ISO 15926 in practice & CFIHOS



Paul van Exel, Director Stichting USPI-NL
Anders Thostrup, Strategy Advisor, Shell Projects & Technology



Proposed agenda



1. USPI (5)

- Mission/vision/organization/activities
- Industry information maturity (ORCHID)

2. ISO 15926 development (10)

- Purpose and Roadmap
- Adoption in practice observations and challenges

3. CFIHOS (10)

- Purpose and project
- Participation and implementation

4. Nuclear RDL

5. Discussion (5)

6. Point of contact



VISION OF USPI



"Companies in the process industries shall be able to share and/or exchange electronically the information needed to design, build, operate and maintain process and power plants using internationally accepted standards".



MISSION STATEMENT USPI



“To develop, maintain and promote the use of international standards and *best practices* for product and plant life cycle information Mgt”

With the aims:

- ***To achieve quality information required in the delivery of products and installations that are safe, reliable and environmentally friendly.***
- ***To achieve shorter project delivery time, lower costs and support innovation.***

With the intent

- ***To seek synergies and exchange of knowledge with the other sectors ship, Aeronautics, “Building” through focused Special Interest Groups created on basis of mutual requirements***



ORGANISATION USPI



■ ASSOCIATION USPI-NL, CREATED 1997

- Non-profit
- Plant Owners, EPC's, Equipment Suppliers, Consultancies, Software Vendors, Training Institutes and Universities
- Committees
 - Executive Committee daily operation, 5 staff (Shell, Fluor, Croon, Capgemini, USPI)
 - Management Board, Strategic endorsement, 26 members

■ STICHTING USPI-NL, CREATED 1997

- Same mission, vision, management
- Contributions, payments, VAT, non/profit
- Low fixed contributions, projects at cost



MEMBERS USPI-NL



AVEVA, Bentley Systems, Braindex (Bink Beheer),
BlueCielo, **CB&I**, Capgemini, **Cargill**, CGI (ex
LogicaCMG), **Croon Elektrotechniek**, Cure Maintenance
Consultants, Datum360, **Etteplan Tedopress**, **Grontmij**,
Hawar IT, Reed Elsevier Opleiding & Advies, **Fluor**,
Intergraph, KAIST University Korea, **Lyondell-Basell**,
Match IT, OntoConsult, PhusionIM, Red-Bag, **Shell**
Global Solutions International, **Technip**, **Versatec**
Energy

Name in red = industry company



KEY ROLES USPI-NL



- 1. Platform function (next slide)**
- 2. Set strategy and direction for life cycle data**
 - NGS, Orchid, Wilmington agreement,
- 3. Provide implementation frameworks, methodologies**
 - CFIHOS, ISO 15926-78/11, MKM, AsBuiltBest Practice, ICAAMC model
- 4. Act as knowledge centre**
 - Maturity Assessment, PELC, Study success standardisation, Plant Owners WS, ISO 15926 WS, Business Case WS,
- 5. Develop, maintain and enhance international standards**
 - ISO 15926, AP221, contribute to ISO 13584, ISO 18101, IEC 16987, ISO 8000

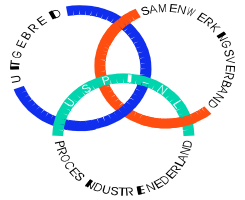


PLATFORM ROLE USPI CONTACTS ABROAD

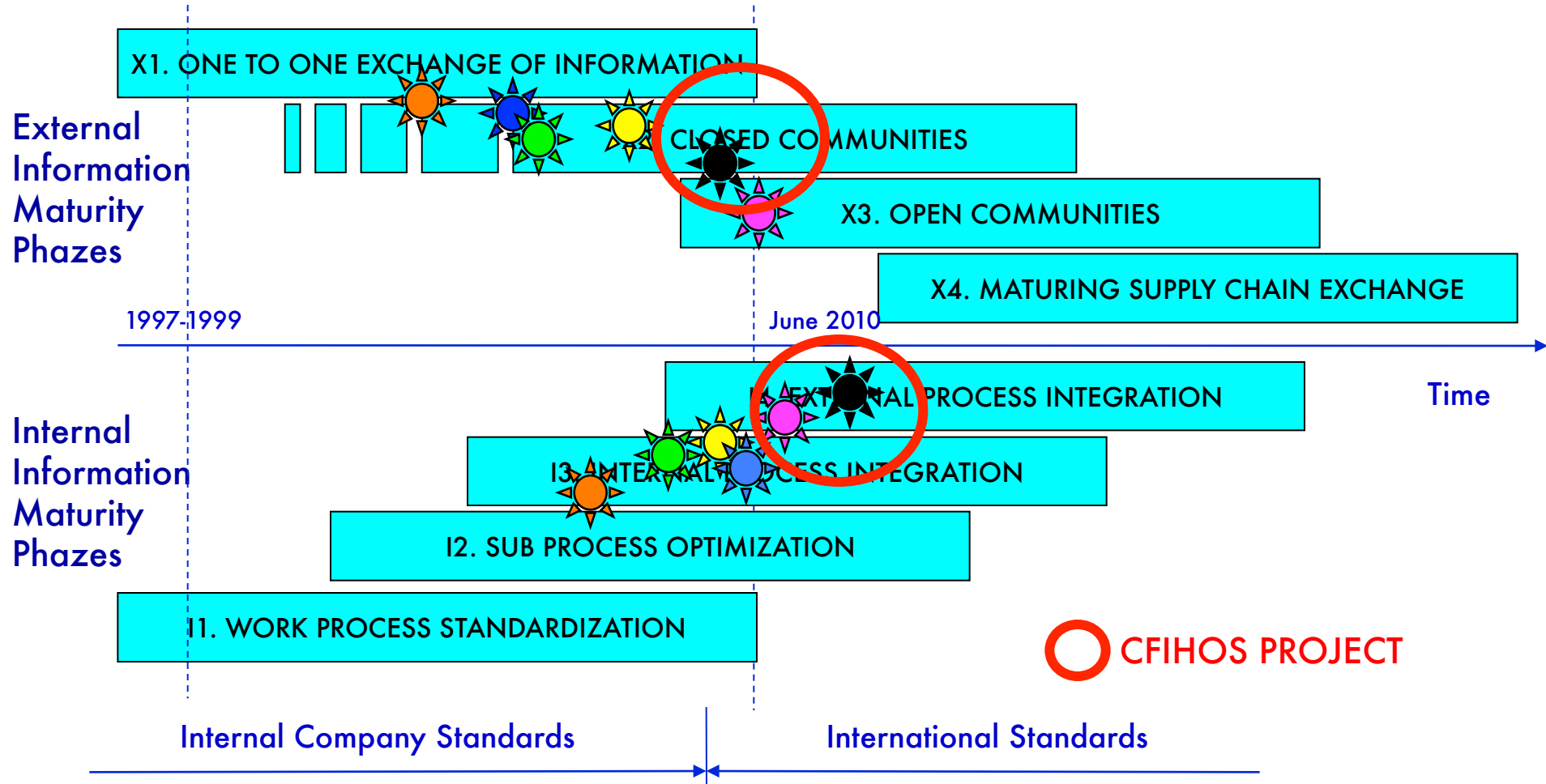


FIATECH	Association for capital projects and technology innovation, USA
PCA	Caesar Association, Norway
NAMUR	Association of chemical and oil companies, Germany
ISO	TC 184/SC4 WG3 Convener, Implementation Forum) International standards community for industrial data and automation
THTH	Association of pulp & paper industry, Finland
eCl@ss	Association for classification of products, Germany
ICAAMC	Association for compressor manufacturers, Global
ENAA	Association of owners, EPC Contractors and equipment suppliers, Japan
MIMOSA	Association for O&M standards process industry, USA
PIDX	Association for eBusiness supplier driven, USA
EPRI	Association for electric power, incl. nuclear installations, USA
VGB	Association power installations, Germany (started contact)
IAEA	International Atomic Energy Agency
SLC	Standards Leadership Council. USPI joined recently and is involved in creating the Owner Operator Forum

ORCHID (CEN CWA 1/2/3) Information Maturity Individual companies

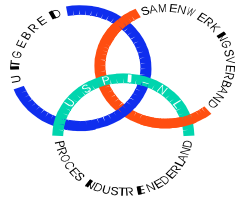


Dots represent information maturity six large companies measured in period 2002-2006, have moved since then





SEPARATION SLIDE





Adoption of ISO 15926: Actual practice



1. Precursor Reference Data Libraries of ISO 15926-4 have been used many years.
2. The Engineering Information Specification (EIS) from Shell makes use of ISO 15926 by referencing ISO 15926-4. Owner Operators (Shell and NOC's) and EPC's companies work with EIS. The EIS has been converted into CFIHOS as industry standard.
3. Daily reporting Hub in EPIM Norway uses ISO 15926-4 type reference data and ISO 15926-2 for modeling.
4. EPIM EqHUb for providing a catalog of common equipment data makes use of ISO 15926-4 as reference.



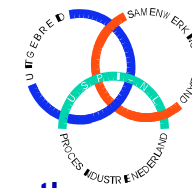
Adoption of ISO 15926: Pilots /developments



1. KHNP South Korea developing a company RDL based on ISO 15926-4 and CFIHOS RDL with assistance of KAIST university. They have interest in a common nuclear industry RDL.
2. IIM Project is piloting ISO 15926-2/4/7/8 for documentation of P&D's and 3D models
3. Oil & Gas Interoperability (OGI) Pilot by MIMOSA, PCA, Fiotech, USPI and Energistics a aiming at transfer of P&ID data from engineering systems for provisioning of historian - OpenO&M Use Case 1 and 10
4. EDRC project by Fiotech aims at developing common equipment data requirements using ISO 15926 7/8 and at assessing conformance to ISO 15926.
5. DEXPI project (German Group) exchanging intelligent P&ID information using a data exchange model using ISO 15926-2/4
6. ISDD project by MIMOSA improves standard data sheets from ISA, API etc by referencing the fields to ISO 15926-4 and other reference data libraries such as SV-RDL. Both project and O&M are covered. Exchange is based on MIMOSA CCOM
7. IST project by PCA aims at improving standard data sheets from NORSOK to populate the EPIM catalog for equipment data.



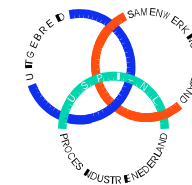
ISO 15926 alike: Pilots /developments



1. China development of standard with reference data for nuclear installations. Currently no information available, soon to be shared
2. EPRI development of knowledge reference data base for nuclear installations with the aim to improve the quality of the information. A vast approach, project has been stopped as such, is integrated into IAEA development of the PIM
3. IAEA work on the Plant Information Model for nuclear installations. A large project to achieve consistent reference data. Involvement of large companies such as Westinghouse. High interest to cooperate with the work on the Nuclear RDL and CFIHOS. Invitation to join workshop in Nov 2015
4. Japan ENAA have interest in CFIHOS and in Nuclear RDL.
5. In UK the Crossrail project makes use of ISO 15926 and ISO 16739 for seamless sharing of data between Crossrail and infrastructure managers. Harmonization of ISO 15926/BIM. Executed by Transport of London and Department of transport. Involvement of Fiotech.
6. In Germany VGB developed VGB R171, documentation standard for power generation plants, using reference data. Cooperation with CFIHOS initiated



Adoption of ISO 15926: Challenges

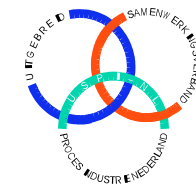


1. Put your standardization ambitions in line with the information maturity of your industry.
2. Cooperate internationally to achieve critical mass and focus on the right way forward and its resources support. The ISO 15926 roadmap can capture the common consensus views on the future and on methodologies.
3. Industry to speak with one voice to the software suppliers to request schema's and suites conforming to ISO 15926.
4. Once a business case has been identified, first develop as common standard as industry standard, implement that in practice (e.g. prototype) and only then transform into an ISO standard. The development of industry should not be held up by ISO consensus processes.
5. When you develop an industry standard be supportive of the long term ISO-IEC confederation of standard to by feeding what you find missing to ISO-IEC (CR's)
6. Agree to work professionally on standards only if there is a proper business case so that it can be done in business time and not in hobby-time.



The ISO 15926 standard: purpose and scope

As documented in Part 1 in 2003



- **Purpose**

- To facilitate integration of data to support the life-cycle activities and processes of process plants. To do this, this International Standard specifies a data model that defines the meaning of the life-cycle information in a single context supporting all the views that process engineers, equipment engineers, operators, maintenance engineers and other specialists may have of the plant.

- **Scope**

- a generic, conceptual data model that supports representation of all life-cycle aspects of a process plant;
- reference data that represents information common to many process plants and users;
- scope and information requirements for additional reference data;
- methods for the analysis of requirements and development of reference data;
- procedures for registration and maintenance of reference data;
- templates for the exchange of data used in a particular context and their mapping to the conceptual data model;
- methods for the development of such templates and their mapping to the conceptual data model;
- conformance to the requirements of this International Standard.



The current parts of ISO 15926

(Existing **and** *planned*)



<u>Part 1 Overview</u>	→	Overview of all parts
<u>Part 2 Data Model</u>	→	Modeling entities
<u>Part 3 Shapes</u>	→	Reference shapes
<u>Part 4 Ref Data</u>	→	Terms, definitions, taxonomy
<u>Part 6 Rules</u>	→	Rules for ref data
<u>Part 7 Templates</u>	→	Basic blocks for prod models
<u>Part 8 OWL</u>	→	OWL rep of prod models
<u>Part 9 Façades</u>	→	<i>Interface for exchange</i>
<u>Part 10 Conf testing</u>	→	<i>Testing the standard</i>
<u>Part 11 RDF-15926</u>	→	Simplified industrial use
<u>Part 12 PWL rep P2</u>	→	<i>ISO 15926 as OWL</i>
<u>Part 13 Planning</u>	→	<i>Support to planning</i>

- **Purpose**

- To document the consensus planning of TC 184/SC 4/WG 3 and stakeholders in ISO 15926 for the required changes to existing parts and the required creation of new parts of ISO 15926 to form a consistent, coherent, complete set of parts that are well maintained and tested.

- **Objectives**

- (1) Document the status of the existing parts of ISO 15926
- (2) Document what new parts of ISO 15926 are required to support industry requirements
- (3) Provide a method to evaluate proposed changes to existing parts of ISO 15926 or proposals for new parts against a consensus roadmap.



The index of the ISO 15926 roadmap

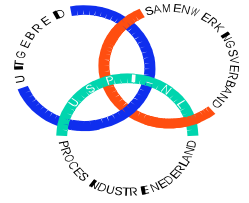


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SEPARATION SLIDE





“Our assets are safe, and we know it”

The explosion occurred when employees were attempting to isolate a leak on a condensate line between the NGL plant and the refinery. Three Crude units were damaged and two Reformers were destroyed. The fire was extinguished approximately 9 hours after the initial explosion. Five people were killed and 50 others were injured. The initial investigation into the loss indicated a lack of inspection and maintenance of the condensate line, which was not owned by the refinery. Confusion caused by the ownership issue is also thought to have delayed the isolation of the line.

Fire / Explosion

25 June 2000

Mina Al-Ahmadi, Kuwait

\$410,000,000

\$600,000,000

Source: Marsh The 100 Largest Losses 1972 - 2009

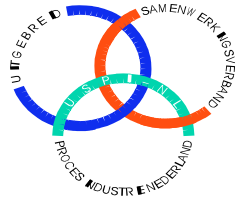
Inclusion in the Shell Engineering Information Specification (EIS) of two requirements relating to prevention of, or managing risk associated with, a Process Safety related incident

These statements are mandatory for all Shell Projects.

Courtesy Shell

CFIHOS PROJECT

(Capital Facilities Information Hand Over Specification)



Purpose and deliverables

Purpose:

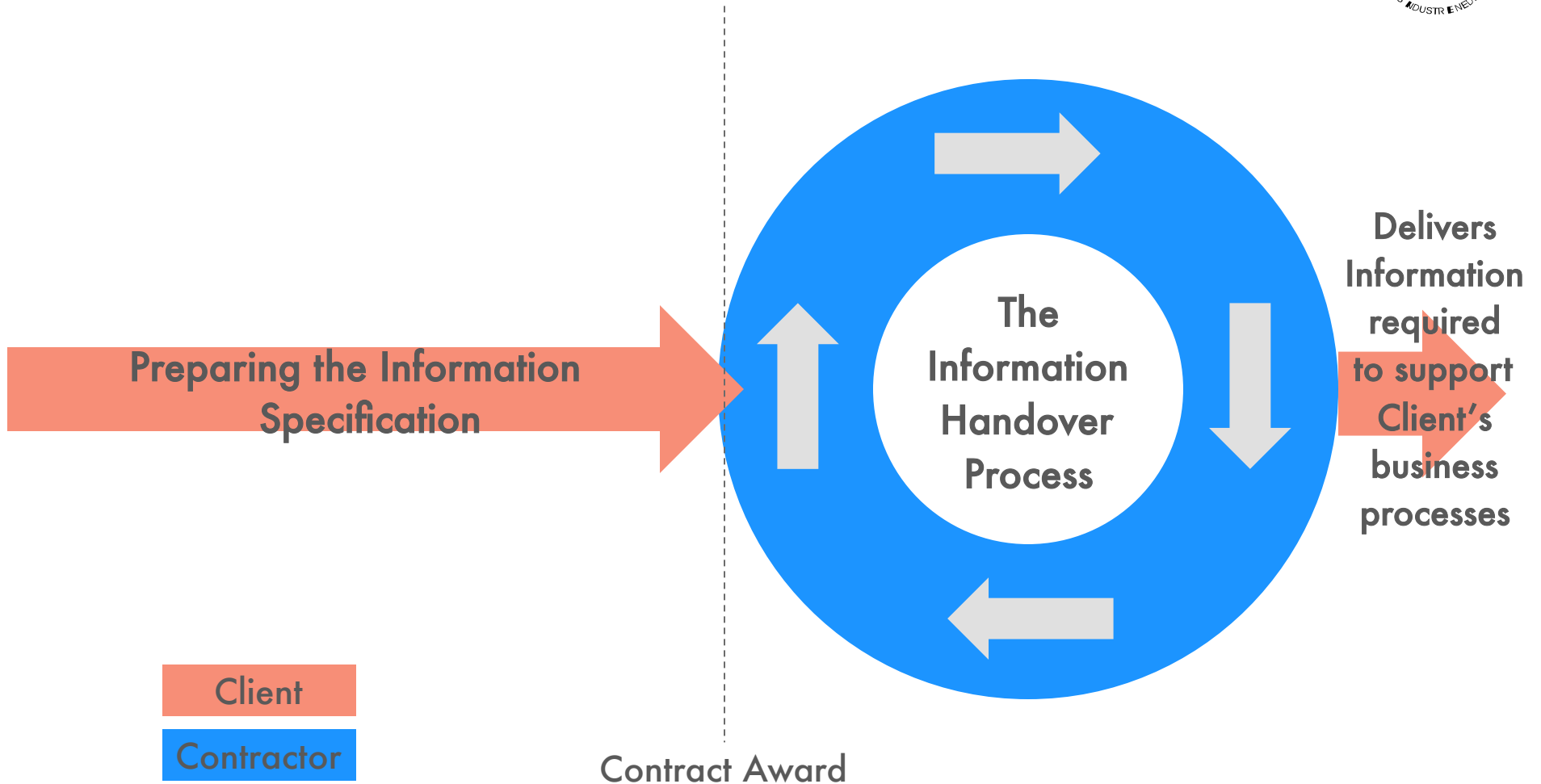
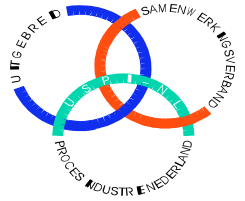
Create a Hand Over (HO) Specification for operators, contractors and equipment manufacturers and suppliers to standardize the specification of information handover requirements for a project

Deliverables:

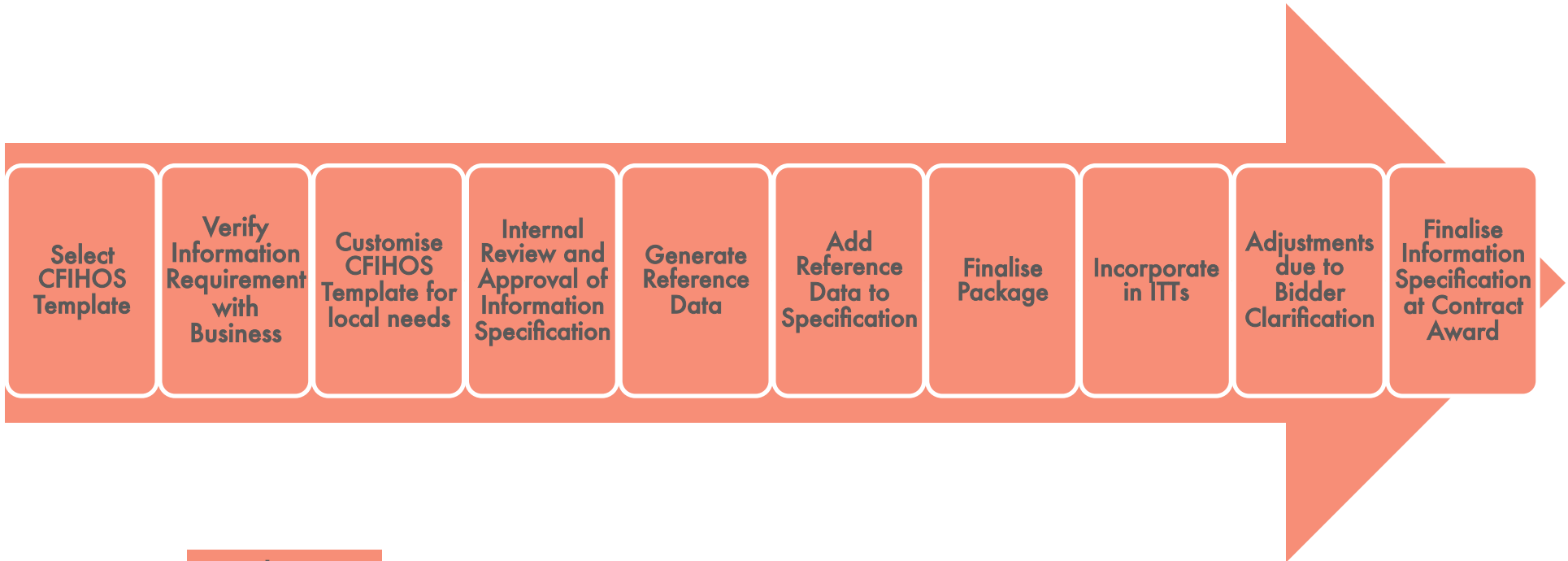
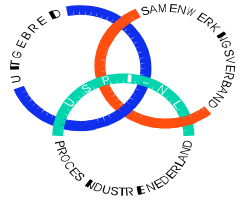
- 1) CFIHOS for “process industry”, Specification document with rules and principles for information handover.
- 2) CFIHOS RDL referencing ISO 15926-4 as common language for the stakeholders working with the CFIHOS specification.
- 3) Tools by commercial software suppliers to adopt the CFIHOS specification in a company.
- 4) Guidance document for all stakeholders how to implement CFIHOS

Note: *The CFIHOS industry standard is available since April 2014
The CFIHOS ISO standard will be delivered in 2016 Q-1*

THE CFIHOS 'LOLLIPOP'

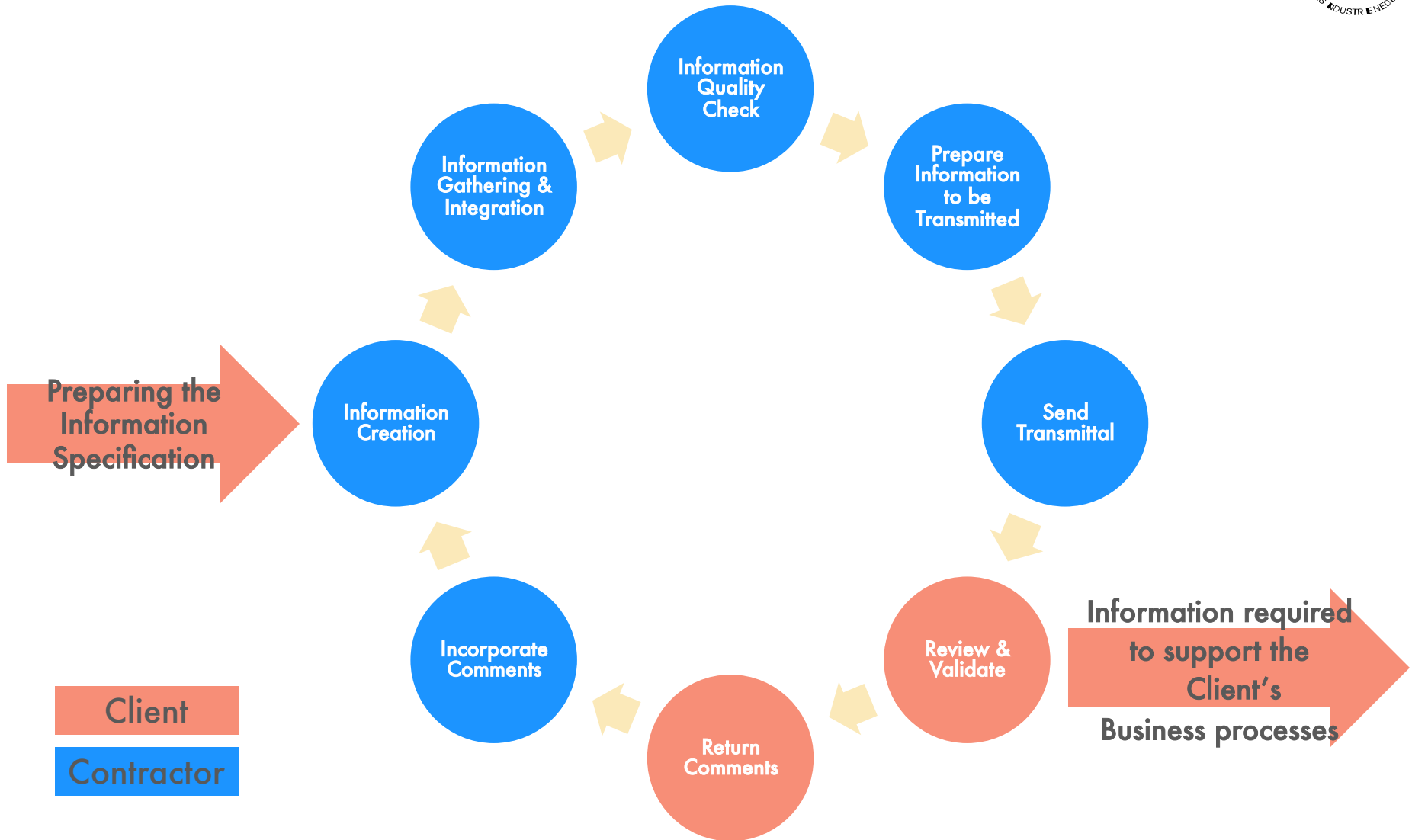


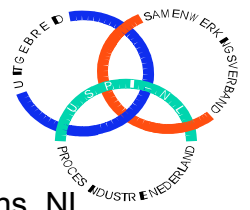
PREPARING THE INFORMATION SPECIFICATION



Client

Contractor





Core team

- Paul van Exel, USPI-NL (project leader)
- Joep Mintjens, PLM Consultancy (project editor)
- Hiroshi Okada, JGC
- Jason Roberts, Shell Projects and Technology
- Hindrik Koning, DSM
- Piet van Merendonk, MatchIT
- Masaaki Kamei, Toshiba
- Yoshiaki Sonoda, Mitsubishi Heavy Industries
- Seunghoon Lee, KAIST
- Erwin Helwig, Q8 (On hold)
- Hajer Chouiref, EDF
- Vic Samuel, Bob Watson, Chevron
- Isozaki Shigekazu, INPEX

Sponsoring review members

- Croon Electrotechniek, EPC Contractor- Installations, NL
- KAIST, Korea Advanced Institute of Science and Technology, Korea
- Cure Maintenance Consultants, NL
- HighSino, Engineering data services, China
- BlueCielo, Software supplier, NL
- Versatec Energy, Software supplier, NL
- Bentley Systems Software supplier, UK
- AVEVA, Software supplier, UK
- Phusion IM
- Datum360
- Unasys

Sponsoring core members

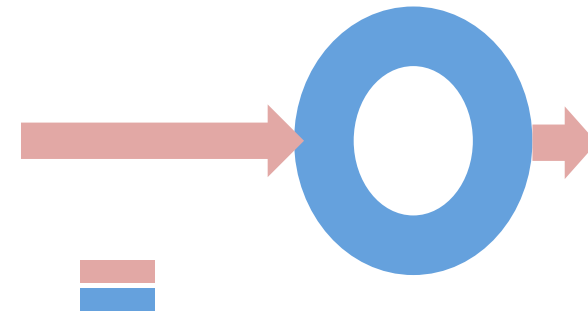
- Shell Global Solutions International
- KHNP, Hydro and Nuclear Industry Operator, Korea
- JGC, EPC Contractor Japan
- Mitsubishi Heavy Industries, EPC, Equipment Supplier, Japan
- PLM Consultancy Group (Switzerland).
- Q8, Oil & Gas Operator, NL
- EDF, Power generation, France
- Chevron, Oil & Gas, UK/USA
- INPEX, Oil & Gas, Japan

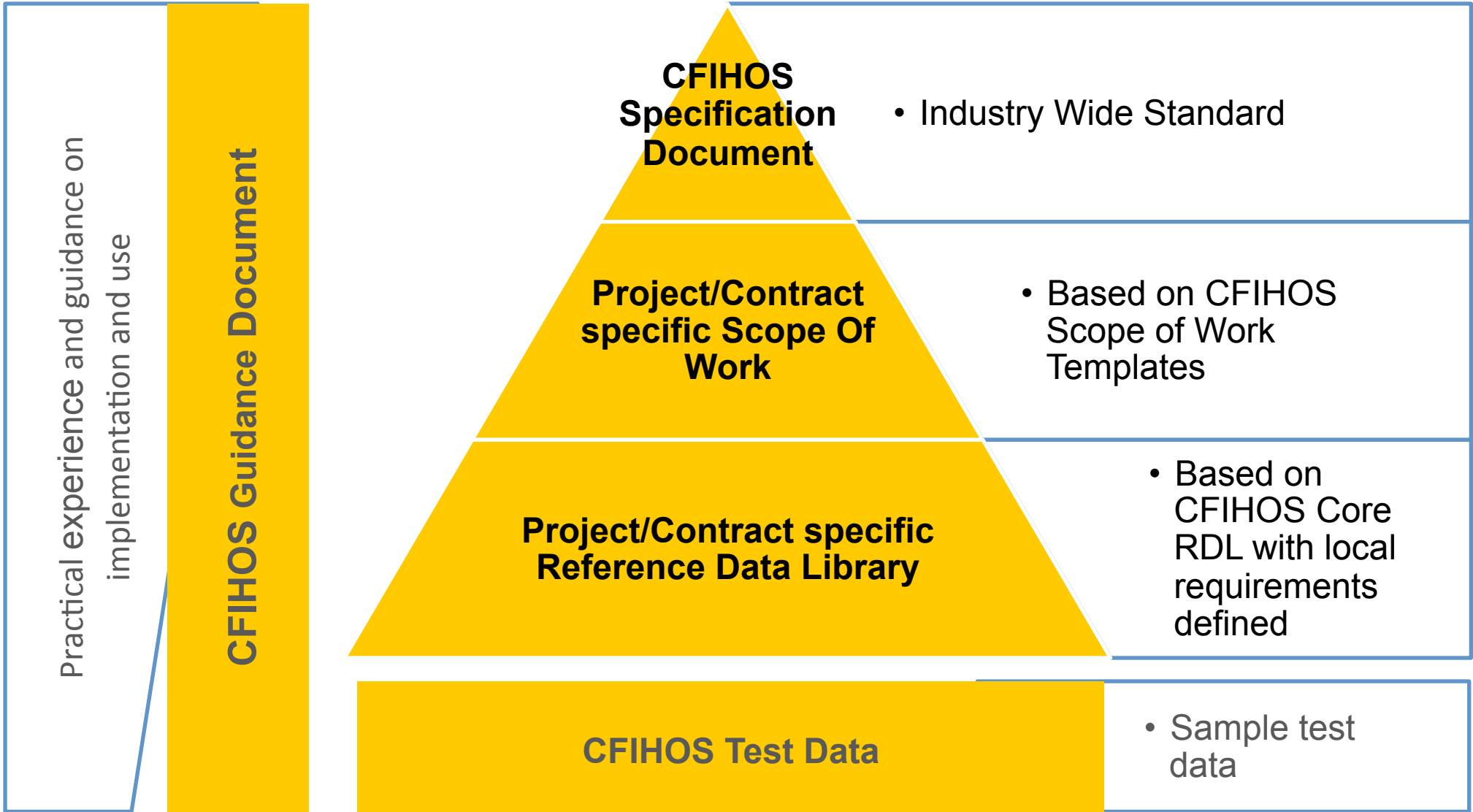
In process of formalising

- AmecFosterWheeler (mgt approval)

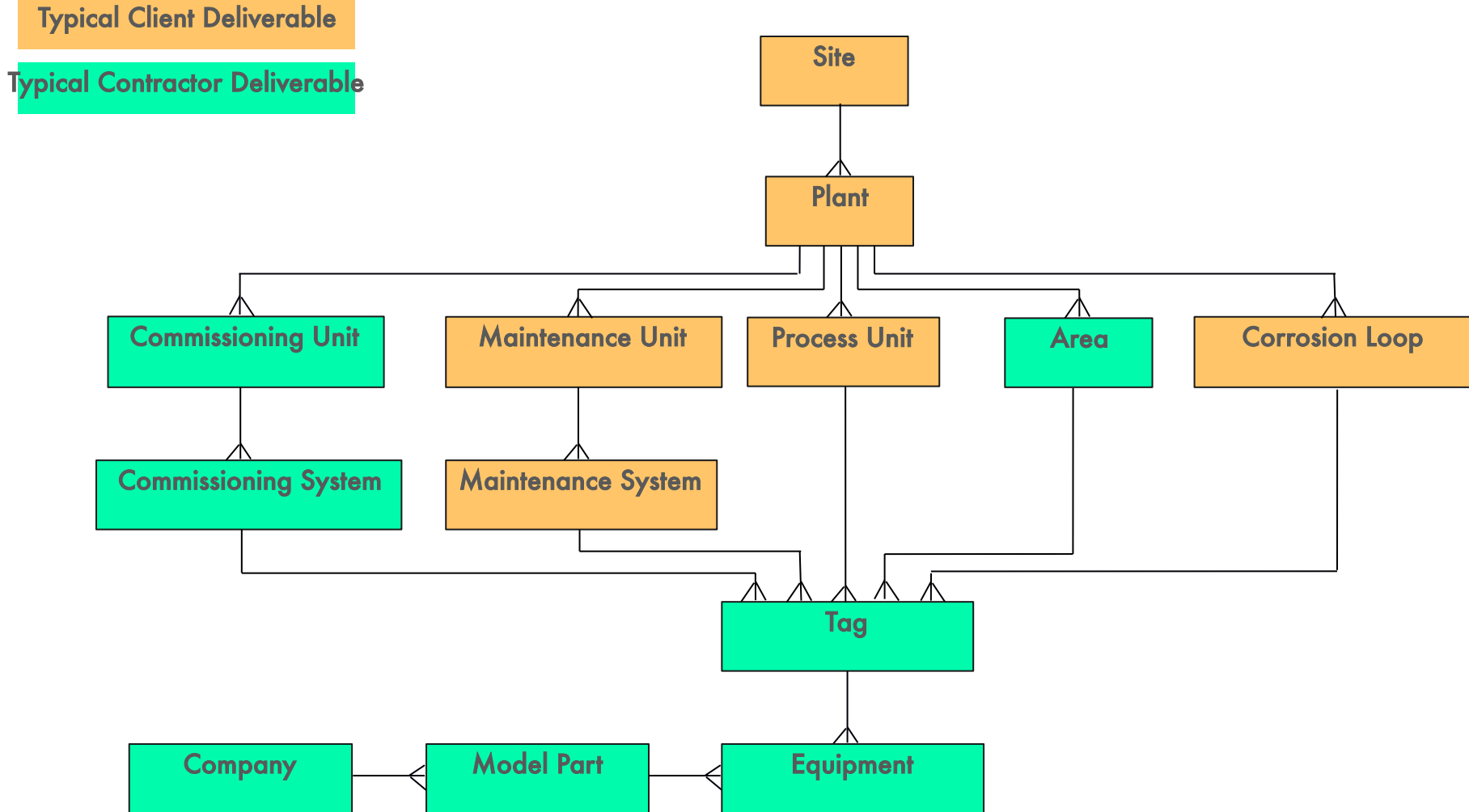
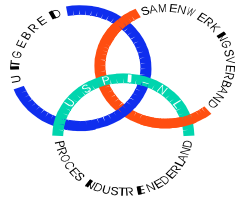
In process of consideration

- Intergraph PP&M, Software supplier, NL
- BP, Oil & Gas, UK
- L&T, Engineering, India
- Saudi Aramco

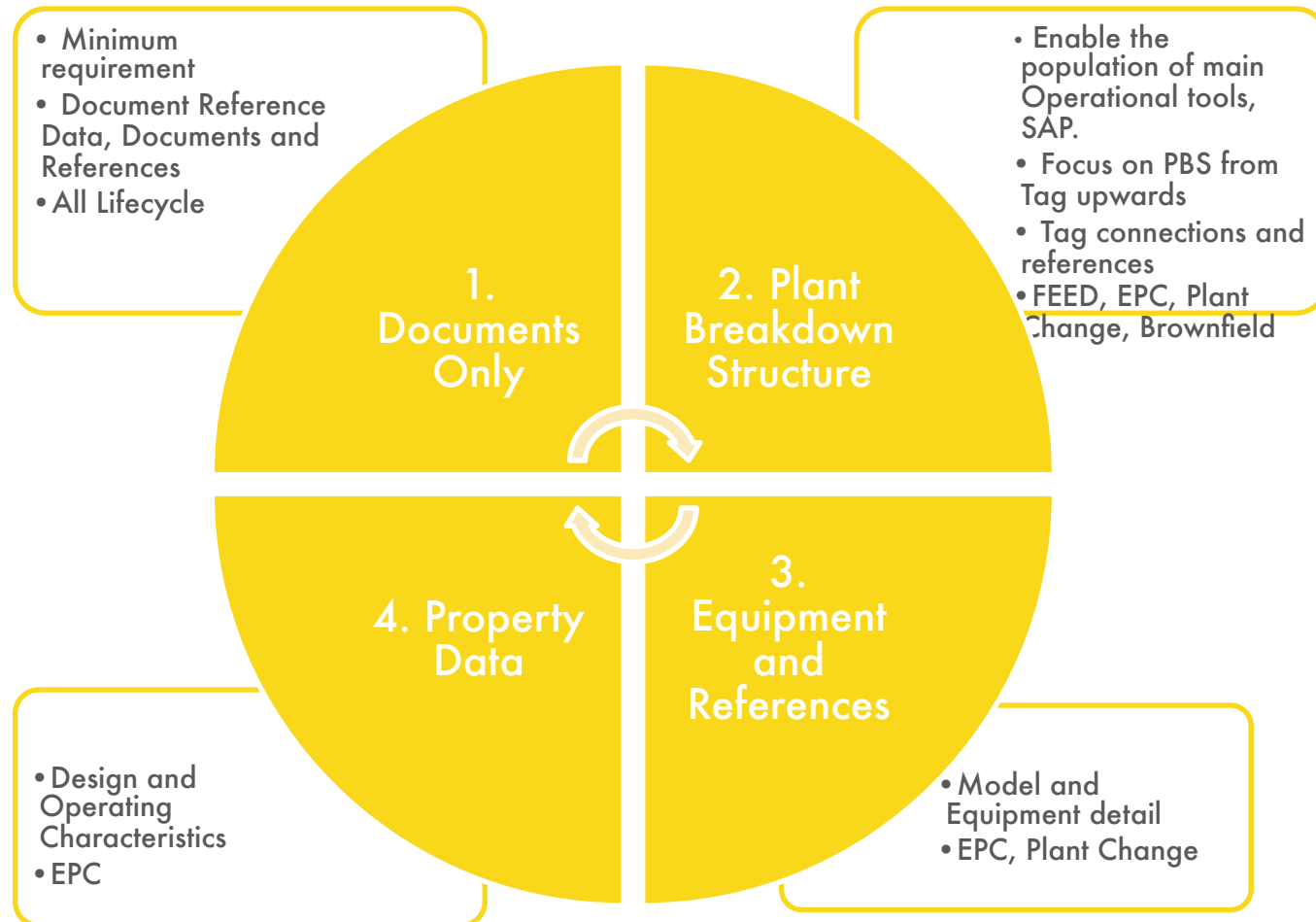


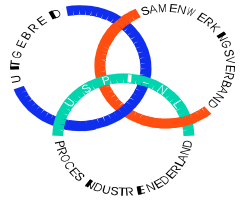


CFIHOS TYPICAL SCOPE: PLANT BREAKDOWN STRUCTURE



Four main subdivisions of the CFIHOS Standard can be identified that bring increasing value to the Owner Operator but also incur additional costs and maturity requirements:





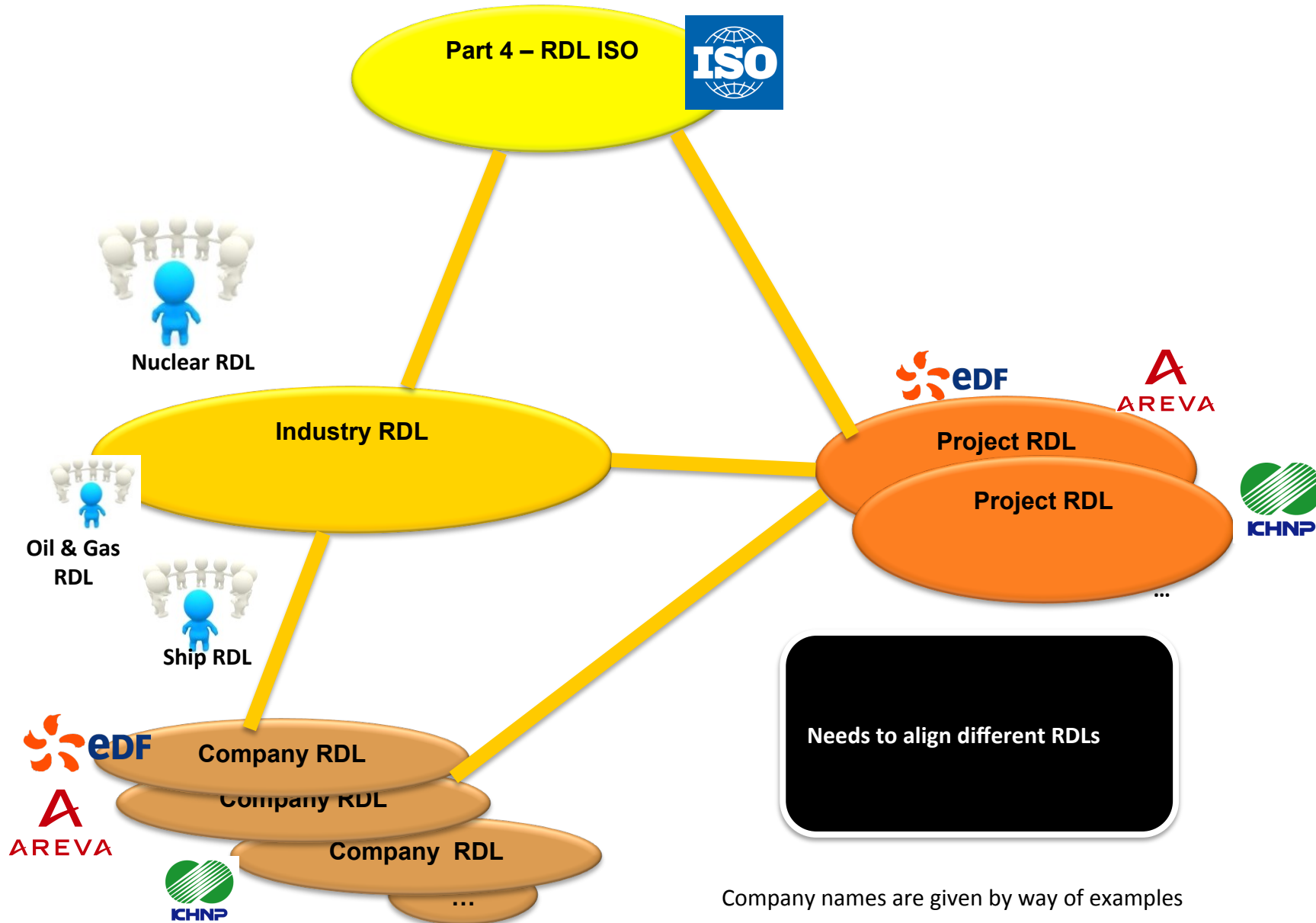


The Nuclear RDL: purpose and status



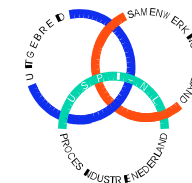
- Purpose of ISO 15926 RDL for nuclear industry
 - To provide common digital reference data for nuclear installations for the full plant life cycle to support all partners involved i.e. owner operators, EPC's, equipment suppliers and regulatory authorities.
 - To ensure plant information that is complete,
 - To support the information to be correct and consistent in combination with ISO 8000 and the Plant Information Model used,
 - To support exchange and integration of information across the plant and across partners.
- What is the business value of introducing a Nuclear RDL in the nuclear plant supply chain?
 - The business value holds for the chain, consisting of Owner Operator-EPC-Equipment Suppliers, supported by software suppliers
 - The business processes take place inside and between these partners
 - There is also business value for the regulatory authorities to bring together all the information needed for licensing, crisis management, information to the public, safe restart and evidence related to environmental impact.
- Status of N-RDL
 - TOR guidance paper N-RDL approved
 - Guidance paper N-RDL in slide format almost approved, guidance paper draft in Word
 - Plan to launch a proposal for a joint industry project to create N-RDL with the various stakeholders.

N-RDL: Different RDL's used in a real project





CONTACT USPI



THANK YOU!

Point of contact for USPI

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