Stichting USPI-NL
Arnhemseweg 6
3817 CH Amersfoort
Nederland
Tel: +31(0)33 4657679
E-mail: stichting@uspi.nl
Web: www.uspi.nl

IM-LCF Project TOR

Terms of Reference IM-LCF project

Date: 01 Aug 2024
Version: 6.0
Authors: Vincent Grondman, Paul van Exel, Leo van Ruijven

Summary

This document defines the terms of reference (TOR) for the workshops series USPI intends to run as follow-up of the Safari presentations by Leo van Ruijven on the PALLAS project and his presentation of 16 Apr 2024 on lessons learnt from information management of large capital facility projects (LCFP)

Purpose

The purpose of the TOR will be to:

- Define the follow-up of the USPI Safari of 16 April 2024 on Lessons Leant from Large Capital Facility projects (Bridging the gap between IM and the Business
- Define a practical proposal for participation, organization and economics of the IM-LCF workshop series.

TOC

Summary 1
Purpose 1
1. Results of the survey done in April 2024 2
2. Lessons learned from the survey 3
3. Logical sequences of the Workshops 4
4. Coherence with other USPI initiatives/workshops 4
5. Details of the proposed workshop series 4
6. Organization 6
7. Economics 7
8. Point of contact 8
Appendix A – Analysis for potential benefits for stakeholders 8

1. Results of the survey done in April 2024

- The survey was done amongst all participants of the Safaris of 2023 and 2024 on the PALLAS project and the participants of the presentation made by Leo van Ruijven on lessons learnt form information management in large capital facility projects.
  The survey asked participants to prioritize the key subjects addressed in the lessons learnt presentation and to tick the deep dive workshops they would like to join.

Table 1: The results of the participant score were as follows:

Key subject as presented	**Score**
Partners in a project consortium all have their own methods, standards and tools	8%
Partners has different maturity in the practice of data quality and data modeling skills	5%
Contracts in many cases don't take explicit into count data quality and data exchange	14%
The vision and support of senior management is crucial for what can be achieved	8%
Lack of integrated and data driven approach of basic project breakdown structures	8%
Lack of IT platforms and software supporting data integration based on open standards	0%
In general, within companies there is lack of knowledge of data integration standards	14%
Select data standards and chose those elements from it that works for the project	2%
It is not self-evident that the added value of a CDE is seen through engineering, maintenance and operations, mostly because of lack of pragmatic data quality	2%
Organize integration between domain knowledge, information and data structuring knowledge and IT knowledge.	14%
Other	17%

- The results of the survey show that the priority key subjects are:
  - Data Quality in contracts

- Knowledge of data integration standards
- Integration of domain knowledge in companies

Table 2: The results of participants' interest in deep dive workshops

	Q1	Q2	Q3	Q4	Q5	Q6
	Integration spec	Tooling spec	CDE	Cleansing Data	Maturity Model	ISO 15926-11
Cerilon	x	x		x		x
RWM GmbH		x	x		x	x
Reliance Industries Limited	x	x	x	x	x	x
MODEC		x		x		x
Technip Energies		x				x
Chevron	x	x	x			
Kinsmen Group					x	x
RoyalHaskoning DHV		x	x			x
DMS corporation	x	x	x	x	x	x
LyondellBasell	x	x	x			
JGC			x			
Interesed parties	5	9	7	4	4	8

- The three deep dive workshops series that score highest are:
  - The specification of tooling required to create a common data environment (CDE) and fill it with (basic)design, engineering and supplier data.
  - Adoption of 15926-11 combined with a RDL (and other international standards) to create a common data environment (CDE) as per ISO 19650 BIM standard
  - A CDE, what it is, its role in a project and or the lifecycle of the facility and how it can be created.

2. Lessons learned from the survey

- The process industry needs understanding of how international standards can support information management in a project and how a CDE can be created representing integrated project data.
- Explain differences between data-integration and interoperability.
- The process industry needs software tooling that can help to arrive at integrated data that meets an adequate data quality.
- Both can be addressed in the deep dive workshops series, starting with the ones that have scored highest.
  - Adoption of ISO 15926-11 to realize data integration in a CDE
  - The specification of a CDE
  - The IM tooling specification

3. Logical sequences of the Workshops

- When studying the results of the survey and what it means to process industry, we came to the following insights:
    - The subjects ISO 15926-11 and CDE are quite close and can better be handled as one.
    - Cleansing of design, engineering data and supplier data is necessary to feed the CDE with consistent and normalized supplier data.
    - The specification of the required tooling can only follow when the functional requirements have been defined.
    - The maturity assessment can only come after we have done the functional workshops and the tooling workshop. We need to consider the ORCHID and ISO 8000 maturity models
    - The Integration specification probably is already covered when we have done the workshop series:
        - Workshop series 1: ISO 15926-11 and CDE
        - Workshop series 2: Data cleansing of raw data from engineering tools
        - Workshop series 3: Tooling Specification
        - Workshop series 4: Maturity assessment (organizational and cultural) and viability of the ambition level of information management.
    - These workshops together will form the IM-LCF project. They will be executed in series, not in parallel. This is to make sure that all participants will have the same exposure to the shared knowledge and will follow the same sequence.

4. Coherence with other USPI initiatives/workshops

- USPI is involved in several initiatives of standardizing information of plants and projects. The subjects of these initiatives will be addressed in this workshop to be sure all initiatives align well. Examples are the “Tagging” project, aiming at knowing what to tag and what not; usage of reference data libraries; the “CFIHOS“ project, aiming at the handover specification from EPC to Owner Operator (model and RDL) and the “FL3DMS“ project, aiming at specifying the 3D requirements.

5. Details of the proposed workshop series

- <u>Adoption ISO 15926-11 to create CDE</u>
    - The workshop series will address how a CDE can be created using ISO 15926-11 and an RDL and other international standards
    - Nominations received:
        1. Nick Meijer - Cerilon
        2. Philipp Duckensell – RWM GmbH
        3. Hitesh Dalal - Reliance Industries Limited
        4. Seemesh Pillai - MODEC
        5. David Camacho - Technip Energies
        6. Edwin Elmendorp - Kinsmen Group
        7. Erik Snip - RoyalHaskoning DHV
        8. Yi Sun - DMS corporation

- Subjects to be investigated
  - What is a CDE and what can be a role of the CDE during engineering and construction and during operation and maintenance
  - What does 15926-11 do for a CDE?
  - How to use a RDL in a CDE
  - What other international standards do we need?
  - How do we create and organize the CDE?
  - How do we use the CDE?
- We believe some 7 to 8 sessions should be sufficient to cover these subjects well.
- Guidance results of the workshop series will be reported.

- <u>Best practice of data cleansing</u>
  - The workshop series will address how the data coming from many suppliers in many formats and models can be transitioned into the CDE
  - In practice this is not a difficult subject but a very laborious task
  - Nominations received:
    1. Nick Meijer - Cerilon
    2. Hitesh Dalal - Reliance Industries Limited
    3. Seemesh Pillai – MODEC
    4. Yi Sun - DMS corporation
  - Subjects to be investigated
    - What are the models and formats in which supplier data are offered?
    - How should those data be transitioned into the CDE?
    - How to handle errors, missing data, inconsistent models etc.?
    - How to achieve acceptance of the final transition data by the suppliers?
  - We still need to decide how many workshops should be required to cover these subjects well.
  - Guidance results of the workshop series will be reported.

- <u>Specification of Tooling</u>
  - This specification should specify what tooling software should be able to provide to make effective use of data integration standards identified in the Lessons Learnt workshop.
  - Nominations received:
    - Nick Meijer - Cerilon
    - Philipp Duckensell – RWM GmbH
    - Hitesh Dalal - Reliance Industries Limited
    - Seemesh Pillai - MODEC
    - David Camacho - Technip Energies
    - Juliette Nguyen - Chevron
    - Erik Snip - RoyalHaskoning DHV
    - Yi Sun - DMS corporation
    - LondellBasell – Rene Brouwer
  - Subjects to be investigated

        - What are the requirements for data integration software, using the following international data standards?
            - ISO 15926-11
            - ISO 15926-6
            - ISO 15926-4
            - ISO 8000
            - ISO 11354
            - ISO 19650
            - ISO 9001
            - ISO 15288
            - ISO 55000
        - What are the requirements for the software we need to process supplier data and transition into CDE?
        - How do we create the tooling specification?
            - Totally new software
            - Additions to existing software
            - Staged implementation of tools (e.g. model wise)
        - How do we use the tooling specification?
        - How do we get the confirmation of the software suppliers on:
            - Is it possible?
            - Is it realistic?
            - Is it financially viable?
    - We still need to decide how many workshops should be required to cover these subjects well.
    - The specification will be reported and made available in the public domain.

- <u>Information Maturity assessment</u>
    - To assess the information maturity of process industry companies to run large capital facility projects and operate and maintain the resulting plants, the ORCHID maturity model is available that can be adopted. The ISO 8000 has a quality assessment model that can be adopted for the assessment of data-quality management.
    - There may be other maturity models of interest to look at. We will look at this more closely later.
    - We still need to decide how many workshops should be required to cover these subjects well.
    - Guidance results of the workshop series will be reported.

6. Organization

- The following model is proposed as the common model for the organization of each of the four workshop series.

    - Project leader is responsible for the delivery of the specification
        - Required: deep knowledge of the subject

    - Specification content approval
        - The project team approves
        - Final say in case of doubt is with Dr. Leo van Ruijven
    - Admin and hosting by USPI
        - USPI has guidance and rules for this from experience with many projects
    - Editor of the specification document
        - Required: familiar with the subject and excellent drafting capabilities
- We note the workshop series consist of 6 to 9 online sessions
- We assume the specifications can be achieved in sessions with 8 and 12 participants. With larger numbers it will be hard to really make speed.
    - We should consider formally closing the workshop series with an FTF session with all participants.
    - Such a FTF session possibly can be combined with the USPI annual MB meeting.

7. Economics

- The IM-LCF project consists of 4 workshop series. The economics of each of these series are very similar. The table below gives the specific economics for the first workshop series CDE/ISO 15926-11

Table 3: example of the proposed economics in €

Workshop series 1		
Number of workshop sessions		8
Assumed nr project members		6
Contribution per member		€1700
Income		**€10200**
Editor hours (notes + report)		52
Editor rate per hour		€85
Editor payment		€4420
Project lead hours		30
Project lead rate		€120
Project lead payment		€3600
Admin services		€360
Admin sessions participation		€270
Total Admin costs		€630
USPI project fee (15%)		€1530

Total costs		**€10180**
Result		€20

- In case significantly more members join, the project fee can be reduced.

8. Point of contact

- Should you have queries, please direct your question to stichting@uspi.nl
- Depending on the subject you will be contacted by the right person.

Appendix A – Analysis for potential benefits for stakeholders

Brief explanation of the effect of the IM-LCF project on the stakeholders in the plant engineering supply chain in the process industry. This taken in to count the organizational and cultural environment

- **Owner Operators** – A consistent and practical approach on how to use the ISO 15926-11 standard to achieve integration of data across the plant life cycle. For example, it would reduce the costs of fixing the fragmentation over time when changes are made in the design configuration data or/and the operational configuration data which could cause compliance issues.
  During the plant's operational phase of say 30- 50 years, maintenance management of data and documents would continuously benefit from a common data environment which is accurate and up to date, migratable and would integrate data from clients, investors, engineering companies, contractors and suppliers. This would have a major impact on interoperability barriers caused by organizational, technological or semantic issues.

  It would also become more advantageous to move from company standards with the high cost of maintenance to international ISO standards.

- **Contractors** – A consistent approach to information handover requirements from Owner Operators would allow Contractors to integrate the information requirements into their corporate business processes and information systems resulting in more efficient delivery and improved quality of the information.

  For example, a heating system consisting of many parts can be described in documents or data with varying data quality, depending on the supplier. A common data environment would breakdown the parts as structured classified data which would result in human readable content

that has a traceability of changes, deprecations and additions during the full life cycle of a plant.

- **Equipment Suppliers** – Similarly to Contractors, the use of a CDE with information requirements as structured classified data would provide suppliers with a consistent view of information requirements enabling that the information from a Contractor is generated on the domain specific class name conventions from ISO 15926-4 that is used in the CDE. For example. Information requirements for a sub part of a heating system that should be changed would always be based on structural data rather than expressed in natural language which would take much more time to process.

- **Software suppliers** – Currently there is a lack of software tooling that can handle project documents and data, integrated over the plant life cycle using a set of internationally adopted data standards. The software industry and its stakeholder would benefit from having a specification for such tooling drafted by the process industry stakeholders.