CFIHOS – Update for THTH spring webinar

29th May 2024

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Agenda

Item No.	Item
1	CFIHOS - Overview
2	Timeline
3	Next Release
4	CFIHOS 2024 Face to Face meeting
5	Any Questions?

CFIHOS - Overview

Our Purpose

The purpose of CFIHOS is to create a handover specification that can be implemented by operators, contractors and equipment manufacturers and suppliers to standardize the specification of information handover requirements for a project.

That is required to own, operate, maintain a facility safely, efficiently and demonstrate compliance to the regulator.

Which is significantly lowering the lifecycle cost associated with incorrect and missing information required to operate a facility.

Our Membership

CFIHOS currently has 83 organisations participating, with over 400 SMEs contributing to the development of the specification across multiple industry sectors.

IOGP Owner Operators	14
Non IOGP Members Owner Operators	9
Software Vendors & Consultants	29
EPC Contractors	22
Equipment Suppliers and Others	6

With 400+ SMEs from the member organizations

Our MOU Partners

Alignment of key industry initiatives to strengthen our common data language

DEXPI Data Exchange in the Process Industry · PCA POSC Caesar Association · NAMUR · Standard Norge · READI · EVOLEN Energies Aujourd'hui & Demain · SEIIA.SE Swedish Industrial Interoperability Association · THTH · MIMOSA

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CFIHOS - Membership

Members

- IOGP Owner Operators
- Non IOGP Members Owner Operators
- Software Vendors & Consultants
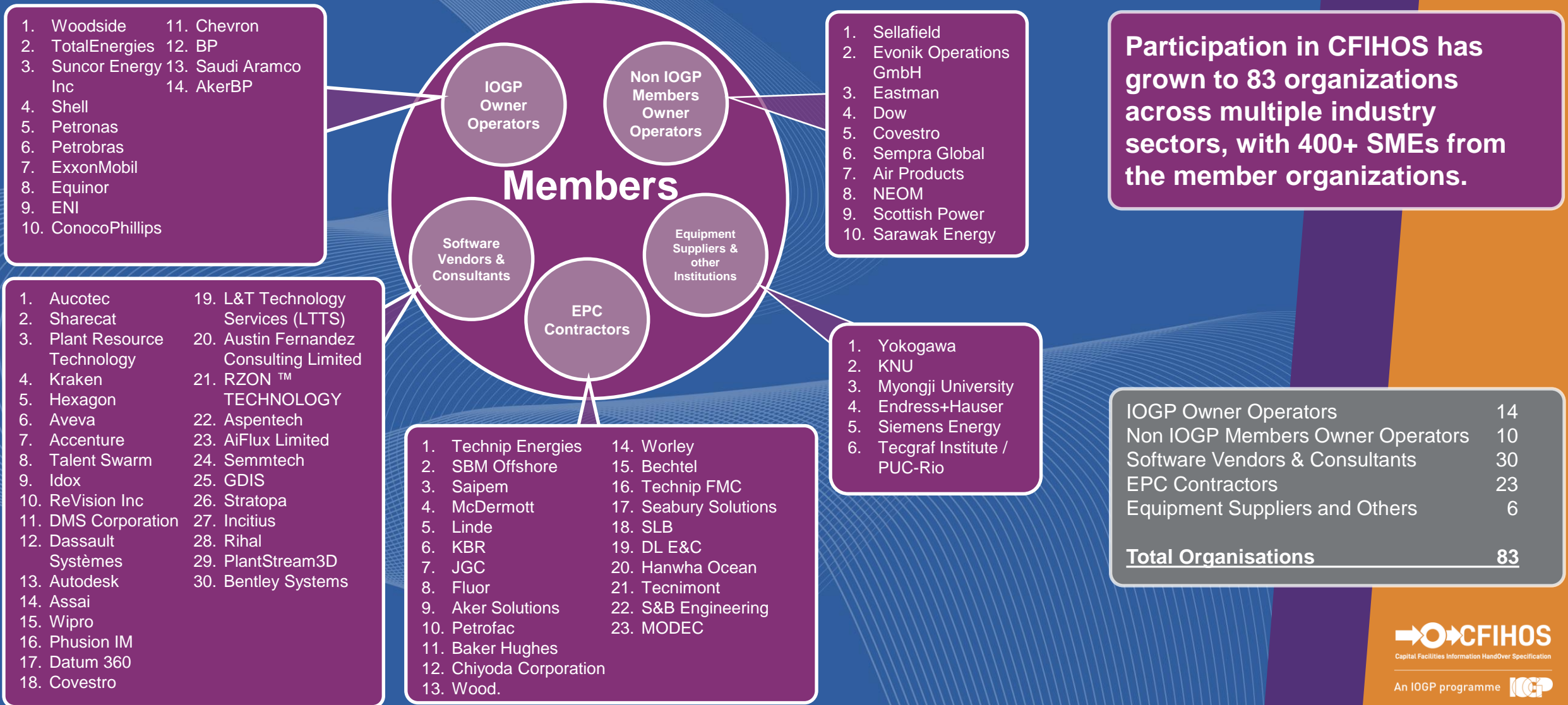- EPC Contractors
- Equipment Suppliers & other Institutions

IOGP Owner Operators

1. Woodside
2. TotalEnergies
3. Suncor Energy Inc
4. Shell
5. Petronas
6. Petrobras
7. ExxonMobil
8. Equinor
9. ENI
10. ConocoPhillips
11. Chevron
12. BP
13. Saudi Aramco
14. AkerBP

Non IOGP Members Owner Operators

1. Sellafield
2. Evonik Operations GmbH
3. Eastman
4. Dow
5. Covestro
6. Sempra Global
7. Air Products
8. NEOM
9. Scottish Power
10. Sarawak Energy

Software Vendors & Consultants

1. Aucotec
2. Sharecat
3. Plant Resource Technology
4. Kraken
5. Hexagon
6. Aveva
7. Accenture
8. Talent Swarm
9. Idox
10. ReVision Inc
11. DMS Corporation
12. Dassault Systèmes
13. Autodesk
14. Assai
15. Wipro
16. Phusion IM
17. Datum 360
18. Covestro
19. L&T Technology Services (LTTS)
20. Austin Fernandez Consulting Limited
21. RZON ™ TECHNOLOGY
22. Aspentech
23. AiFlux Limited
24. Semmtech
25. GDIS
26. Stratopa
27. Incitius
28. Rihal
29. PlantStream3D
30. Bentley Systems

EPC Contractors

1. Technip Energies
2. SBM Offshore
3. Saipem
4. McDermott
5. Linde
6. KBR
7. JGC
8. Fluor
9. Aker Solutions
10. Petrofac
11. Baker Hughes
12. Chiyoda Corporation
13. Wood.
14. Worley
15. Bechtel
16. Technip FMC
17. Seabury Solutions
18. SLB
19. DL E&C
20. Hanwha Ocean
21. Tecnimont
22. S&B Engineering
23. MODEC

Equipment Suppliers & other Institutions

1. Yokogawa
2. KNU
3. Myongji University
4. Endress+Hauser
5. Siemens Energy
6. Tecgraf Institute / PUC-Rio

Participation in CFIHOS has grown to 83 organizations across multiple industry sectors, with 400+ SMEs from the member organizations.

IOGP Owner Operators	14
Non IOGP Members Owner Operators	10
Software Vendors & Consultants	30
EPC Contractors	23
Equipment Suppliers and Others	6
Total Organisations	**83**

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CFIHOS - Alignment MoU partners
Key industry initiatives to strengthen our common data language

User Needs (Demand)	Data Standards (Supply)

International Oil & Gas Producers Association

Standards Committee

↓

Information Standards Sub-Committee (ISSC)
Ranked top seven priorities
1. 3D model standard
2. Project Information Handover Specification
3. Vendor Data and Document Requirements Standard
4. Capital Cost and Planning Data Standard
5. Materials Procurement
6. Equipment and Spare Parts Data Specification
7. Equipment Reliability Data

Capital Facilities Information Hand-Over Specification, CFIHOS

Data model & dictionary (reference data library), scope, specification, implementation guides, software compliance criteria
(Includes 2,3,&6 from ISSC Priority List)

Equipment Requirements JIP 33
Equipment Information Requirements Specifications.

MOU	→ ←	Process Stream and P+ID data - DEXPI
MOU	→ ←	Electrical and Instrumentation Data - NAMUR
MOU	→ ←	Tagging Philosophy & 3D Models (FL3DMS) - USPI
MOU	→ ←	Digital Requirements Mgt (READI) / Industry Data Ontology- Standards Norway and PCA
MOU	→ ←	Construction Mgt / Advance Work Packaging Data – CII
MOU	→ ←	Alignment to IDO and CFIHOS in French - Evolen
MOU	→ ←	Water Industry - NEOM/ENOWA
MOU	→ ←	Power and Paper & Pulp Industry- SEIIA, THTH
MOU	→ ←	Alignment POSC Caesar Association (PCA)

Information lifecycle model – ISO 15926 (Referenced in CFIHOS RDL)

Reliability & Maintenance – ISO 14224 (Alignment / Mapping discussions on going)

Cost and Planning Data – ISO 19008

CFIHOS has established a network of industry bodies to drive alignment and avoid overlap.
Many are now referring to the CFIHOS data model & RDL and only extending if required

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CFIHOS – Key Elements

Key elements of CFIHOS

Narrative Documents library
Scope and procedures Document
How to define the scope of Information Management to support delivery of CFIHOS requirements
Technical Specification Document
Requirements, rules and principles for information handover
Process & Guidance Documents
Outlining implementation steps (and do's & don'ts)

Data Model
For structuring data and documents about assets

Reference Data Library (Dictionary)
Consistent naming of equipment, properties & documents

CFIHOS – Timeline (Where we've been)

Since the initial release in 2014 there have been seven versions published.
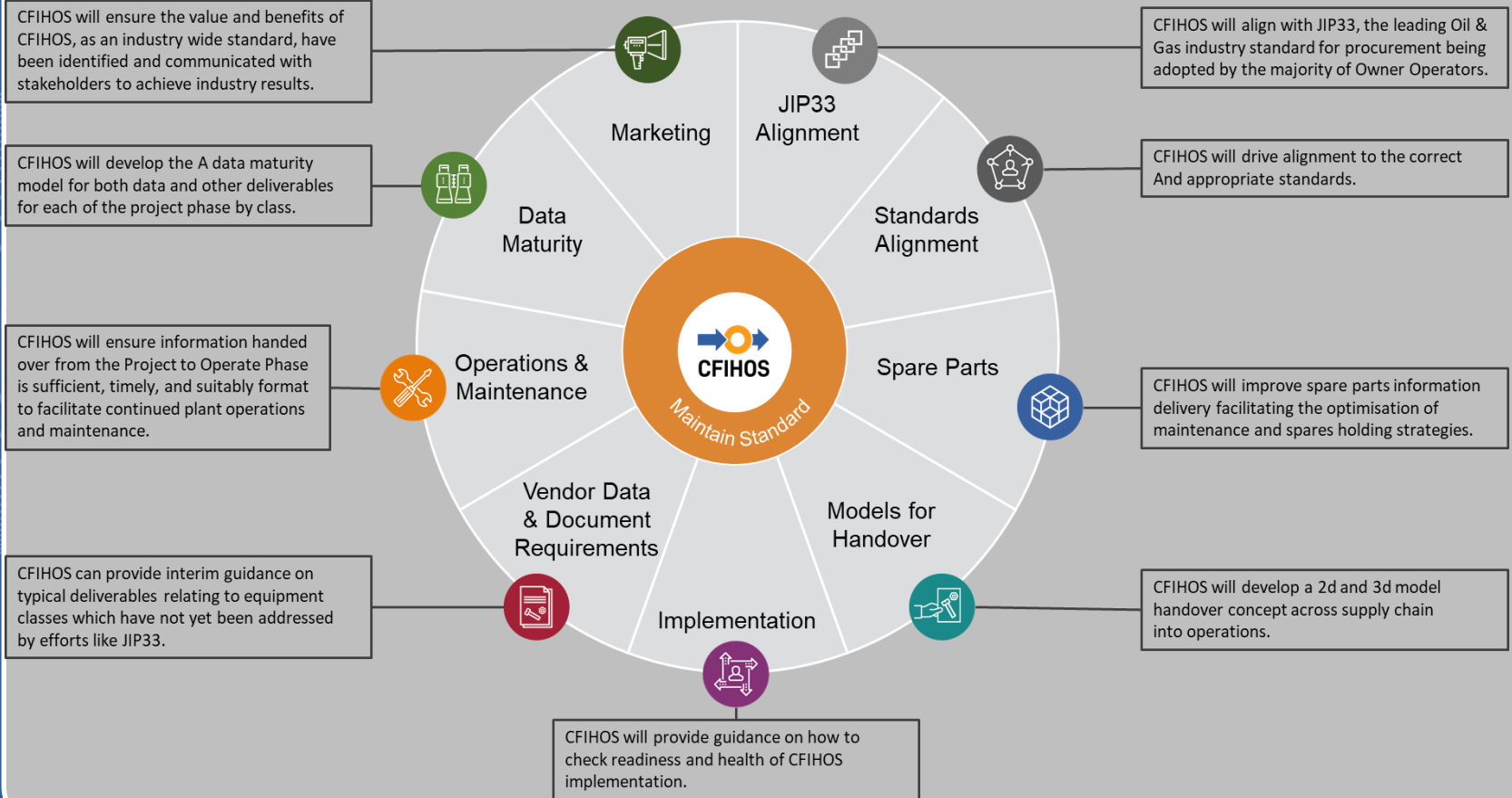
Version 1.5 in November 2021 has been adopted by a large number of organisations from multiple industry sectors across the complete supply chain.

The current version is 1.5.1 which was published in April 2023, a minor release with major content including our first bilingual Chinese version

Published **Version 1.5.1 April** including our **first bilingual Chinese**
Hold our annual **Face to Face members meeting in September**
Publish our **annual adoption staircase data Q3**
Develop content for **Version 2.0**
➤ **Rework of our narrative documents into requirements**
➤ **Additional content to support our short-term goals**

Revalidation of **Our roadmap & priorities** and **Held our Face 2 Face meeting in Stavanger** and developing content for **Version 1.5.1**

Transfer from **USPI to IOGP complete** and **Published Version 1.4.1**

Published **Version 1.4**

Published **Version 1.5**

Proposal to as Transfer from **USPI to IOGP**

Published **Version 1.3**

Published **Version 1.2**

Published **Initial Release Version 1.1**

Founded Shell provided seed standard to USPI

2012 **2013** **2014** **2015** **2016** **2017** **2018** **2019** **2020** **2021** **2022** **2023**

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CFIHOS – Timeline (Where we're going)

2024 Refreshed Roadmap Themes

CFIHOS will ensure the value and benefits of CFIHOS, as an industry wide standard, have been identified and communicated with stakeholders to achieve industry results.

CFIHOS will develop the A data maturity model for both data and other deliverables for each of the project phase by class.

CFIHOS will ensure information handed over from the Project to Operate Phase is sufficient, timely, and suitably format to facilitate continued plant operations and maintenance.

CFIHOS can provide interim guidance on typical deliverables relating to equipment classes which have not yet been addressed by efforts like JIP33.

CFIHOS will provide guidance on how to check readiness and health of CFIHOS implementation.

CFIHOS will align with JIP33, the leading Oil & Gas industry standard for procurement being adopted by the majority of Owner Operators.

CFIHOS will drive alignment to the correct And appropriate standards.

CFIHOS will improve spare parts information delivery facilitating the optimisation of maintenance and spares holding strategies.

CFIHOS will develop a 2d and 3d model handover concept across supply chain into operations.

Wheel labels: Marketing · JIP33 Alignment · Standards Alignment · Spare Parts · Models for Handover · Implementation · Vendor Data & Document Requirements · Operations & Maintenance · Data Maturity

Center: **CFIHOS** — Maintain Standard

Publish **version 2.0 during early Q2**

Continue **Standards alignment**

Develop content for the **next release** including:
- Maturing **renewables content, Vendor Data & Document Requirements**
- Development of **Data Maturity Model**

Hold our annual **Face to Face members meeting in September**

2024

Publish **Next Release Q1** Including additional **bilingual content**

Continued development of the **backlog to deliver core roadmap requirements**

Mature **renewables content**

Publish **interim versions when meaningful content is available**

2025 +

Next Release - Overview

Version 2.0 encompasses 26 Feature Requests (FRs) and signifies the most extensive update to the specification to date

- Refactoring of the specification document to support use of requirements management tools

- Inclusion of specific attributes, UOM, and documents required to create a reliable inventory of GHG emissions from capital projects, with specific attention to scope 3

- Aligned with then Energistics UOM standard

- Significant RDL JIP33 alignment

- Alignment with EPIM SDI 'Rule of Thumb' Document Type to Equipment Class

- ISO 14224 Enrichment of CFIHOS

And much more!

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Next Release - Overview

Reference Data library updates
- 51903 Items affected
- 16062 items added
- 837 item terminated
- 35004 edited.

RDL Element	Total items affected	Number of New	Number of Terminated	Number of Edited
application condition	31	13	0	18
CFIHOS object equivalent mapping	302	302	0	0
discipline document type	163	73	0	90
document type	58	24	0	34
RDL master object	14887	6004	143	8740
entity	31	22	2	7
entity attribute	68	41	5	22
entity attribute relationship	216	147	19	50
equipment class	30	26	0	4
equipment class property	2109	285	0	1824
property	4021	705	0	3316
property picklist	217	214	3	0
property picklist value	1627	1291	128	208
property group	1506	251	0	1255
property group allowed for purpose	1506	251	0	1255
property grouping or decomposition purpose	6	1	0	5
property to group assignment	6696	1116	0	5580
source standard document and data requirement	3486	1322	1	2163
source standard document and data requirement condition	100	100	0	0
source standard	466	141	0	325
tag class required discipline document type	587	0	532	55
tag class equipment class relationship	26	26	0	0
tag class	30	26	0	4
tag class property	4858	666	0	4192
tag or equipment class source standard	393	334	0	59
tag or equipment class property source standard	6912	1152	0	5760
unit of measure	1426	1385	4	37
unit of measure dimension	145	144	0	1
Totals	**51903**	**16062**	**837**	**35004**

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Next Release - Overview

Data RDL

FR83 - JIP33 Alignment: S-703
FR84 - JIP33 Alignment: S-560
FR85 - JIP33 Alignment: S-620
FR86 - JIP33 Alignment: S-562
FR94 - JIP33 Alignment: S-615
FR108 - JIP33 Alignment: S-704
FR109 - JIP33 Alignment: S-733
FR47 - ISO 14224 Enrichment of CFIHOS
FR80 - Missing or incomplete descriptions for Property Picklist Values
FR96 - Additional Classes and Properties for Owner Operator Usage
FR98 - Energistics UOM Upgrade
FR100 - Optional RDL attributes/documents to track GHG emissions
FR107 - Property Association to Tag and Equipment Class

Document RDL

FR28 - 'Rule of Thumb' Document Type to Equipment Class Reference Including EPIM SDI
FR121 - Additional Document Type Synonyms
FR179 - Align CFIHOS Discipline Document Types with JIP33 (Extension to FR16)
FR180 - Changes to Representation Type in Discipline Document Type table

Implementation

FR65 - Spec Doc Requirements Annex
FR90 - Addition of reference requirements to Specification Document

Data Model

FR20 - Tag or equipment class composition
FR57 - Property groupings
FR70 - Addition of Tag Model Relationship
FR73 - Spare parts
FR91 - Extension of the Plant Breakdown Structure – Industrial Complex

Project

FR122 - Bugs to be fixed via the V2.0 Release
FR181 - Amend RDL Content (CSV/XLS) Table/Tab Output Names to Align with Data Dictionary

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Next Release - Attributes for GHG Calculations

FR100 - Optional RDL attributes/documents to track GHG emissions

- Inclusion of specific attributes, UOM, and documents required to create a reliable inventory of GHG emissions from capital projects, with specific attention to scope 3

- e.g. attribute "cradle-to-gate emissions" definition "greenhouse gas emissions arising from the extraction, processing, transportation and manufacture of materials and equipment up to the point where they leave the factory gate to be taken to site."

- These attributes are not intended to replace or compete with existing GHG calculation standards or methodologies but ensure they can be completed by collecting the right data and support the use of established standards

- Can be used to help for calculations such as Carbon Border Adjustment Mechanism (CBAM) or the Inflation Reduction Act (IRA)

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Next Release - Upgrade to the SpecDoc

FR65 - Spec Doc
Requirements Annex

- Refactoring of the specification document to support use of requirements management tools

- The content of the SpecDoc is now broken out into a series of "shall" statements that can be used in isolation, these form the heart of the CFIHOS requirements and go hand in glove with the RDL

- Each shall statement can be referenced with an ID allowing users to trace specific requirements back to CFIHOS and use them in their contract stack and requirement management tools

- Application specific data is now listed as an annex to the SpecDoc rather than a core part of the specification and a table of examples is provided that can be modified by the user

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Next Release - Upgrade Units of Measure

FR98 - Energistics UOM Upgrade

• Aligned with then Energistics UOM standard

• ~1400 additional units of measure significantly increasing the units of measure available to users, from a previous 92

• Unit of measure symbols now reduced special characters for improved data integrity

• Includes mapping to UNECE units

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CFIHOS - 2024 Face to Face hosted by PETRONAS

Unifying the Supply Chain with the CFIHOS Specification

Late September Early October 2024 TBA

Kuala Lumpur

Industry Engagement

Training: What is CFIHOS & How it Fits together

Hear from our MOU partners

Format: Presentations - Implementation Stories - Discussions - Q&As - Tabletop Exercises

Detailed agenda being developed, and registration opens in June.

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Any Other Questions?

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