Software support of CFIHOS business process

Standard version – 1.5.1 (Conformance template revision D)

Conformance Coversheet

Software submission identifier: Hexagon SDx.2025.6 v1.5.1

Company name(s): Hexagon Asset Lifecycle Intelligence (ALI)

Overview

HxGN SDx is a digital twin solution for excellence in engineering, operations and maintenance. Providing integration with many systems of record, interoperability across many vendor formats, resulting in a harmonized, contextualized and reliable set of documents and data. Refreshingly differentiating from the norm by providing many work processes that leverage and keep evergreen the underlying data and documents, examples: Engineering Change, Document management and control, Work packaging, Design review, Asset modelling and visualization, Asset lifecycle data and information management.

SDx provides a CFIHOS conformant enterprise solution, being the gateway to the CFIHOS information stream. The Hexagon and 3rd party design tool integration with our IM solution provides a change-managed clearing house for asset and design data.

This statement of conformance only applies to SDx.

Conformance

Categories: A1, A2, A4, B1, B2.

In future we will provide evidence of our conformance to B3, C1, C2, D1, D2, D4, E1, E2, F1.

Here are some more key points regarding SDx support for CFIHOS:

- The highly configurable nature of SDx, ensures that we are able to support our customers' various data modeling needs.
- we provide OOTB mappings to the CFIHOS classifications and respective attribution, that is visible on the data forms in the solution
- we continue the theme our customers enjoy and the very portable nature of using Excel to manage mappings, include/exclude attributes
- SDx has fit for purpose work processes that support the exchange of information between organizations, incoming via submittals and outgoing via Transmittals.

Roadmap:

The customer can decide what versions of CFIHOS they want to support. Whilst SDx has a powerful workflow engine and is able to support many work processes we agreed that we wouldn't conform with A3 and F2. However we are very confident this could be configured as part of the overall environment.

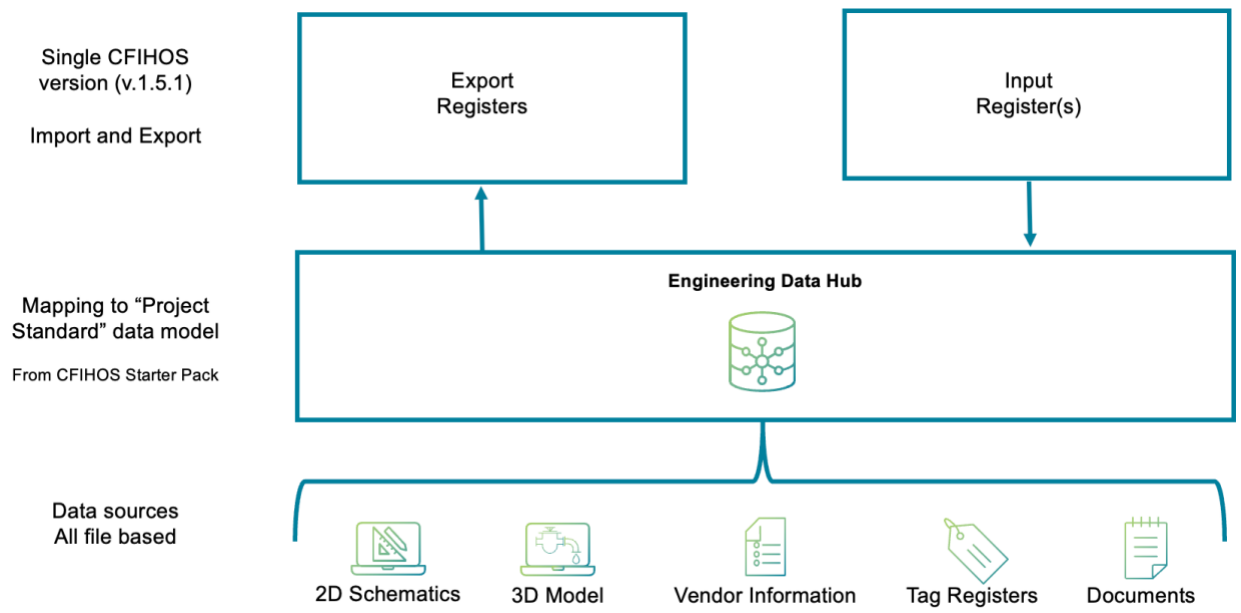
There are planned enhancements, around compliance and completeness reporting, phasing based on project milestones (D3).

Notes

Guiding Principles

- Hexagon's position is that CFIHOS is an "Information Handover Specification", as the name of the organization implies
- We achieve CFIHOS compliance at our SDx solution
- Our tools integration with our SDx solution provides a change-managed clearing house for asset and design data
- This provides a CFIHOS conformant enterprise solution with IM being the gateway to the CFIHOS information stream
- CFIHOS is defining datasets for software vendors to use in validating conformance; we believe this is a good thing and sets a common reference for "CFIHOS Conformant" claims
- Some CFIHOS members are expressing requirements for APIs; some discussions are trending towards having defined API connections between applications rather than a pragmatic handover specification
- We believe this may be a "bridge too far", potentially pushing the bar for CFIHOS implementation beyond the capabilities of many companies and participants in the flow of asset information

The landscape diagram below shows how SDx will support CFIHOS.



Phase A – Project Standard Preparation

Category A1 – Store CFIHOS Standard

Demonstrate how the principal can use a release of the CFIHOS standard as a baseline for one or more projects and manage any impact from subsequent releases of the standard (e.g. different projects based on different releases).

Supported: Yes, based on our experience working with our customers and listening to industry experts, we believe the most effective solution is to provide flexibility in our offering. Let the customer decide what is important to them per project, allowing them to reduce and extend the CFIHOS standard (envelope principal). We underpin this with our highly flexible data model. We provide all properties in our configurable model and customers can decide to exclude or add. From the register's perspective, we provide flexibility to add or remove attributes without having to change mappings, flexibility being key.

Software: SDx

Evidence:

Evidence	Timestamp
Initially you can see that OOTB we have placeholders ready to store the standard. We maintain the current release that is easily accessible and maintainable. We show how to extend the standard, add an additional Document classification, how the standard is grouped into the various types, using excel worksheets. These then generate "load sheets" that can be revised and used for comparisons, then imported into SDx and validated. You can see that interactive creation wizards for both documents and tags now reflect the CFIHOS standard loaded. The flexibility of the solution supports multiple releases, pick the one you want to use and extend, excel provides the familiarity users enjoy and they have full control at the file level in managing the configuration/differences and deciding what to load and use as their basis.	…A1.mp4
https://www.dropbox.com/scl/fi/g6n8afz41hnb1son1topq/HxGN-SDx.2025.CFIHOS1.5.1-Evidence.A1.mp4?rlkey=kdx92loe4uf5naimj8n18lfv0&st=2qqivxzm&dl=0	To View

Suggested Evidence:

1. Show how the current release of the CFIHOS standard can be imported into the software.
2. Show how the imported CFIHOS standard is represented and managed.
3. Show how data in the CFIHOS standard can be grouped into contract scenario templates.
4. Show how future releases of the CFIHOS standard might be imported, assuming the same data formats but potentially with additional detail (e.g. tag / equipment classes or properties) or entities (e.g. flexible support for new concepts).
5. Show how multiple releases of the CFIHOS standard can be stored.
6. Show how the differences between different releases of the CFIHOS standard can be understood.

References:

- CFIHOS Scope and Procedure, sections 9.1, 9.2
- CFIHOS Guide for Principal, section 3.1.1
- CFIHOS Guide for Contractor, section 2.1.2

Category A2 – Define Project Standard from CFIHOS Template

Demonstrate how the organization or project can adapt the CFIHOS standard to their specific context.

Supported: Yes, we provide a starter pack, that defines the classifications and attributes. This is easily edited, using excel, a great starting point where additions/exclusions are supported. So, whether it's taking the CFIHOS delivered standards or helping customers configure their organizational standard we can support. We consistently maintain the unique CFIHOS telephone/reference numbers, providing flexibility for project terminology around display names.

Software: SDx

Evidence:

Evidence	Timestamp
We place a lot of emphasis around our Project object, which sits under the active Plant/Asset. This captures key information like the milestone dates, responsible managers and type of facility. The next step for the project is to define the specific classifications for documents and tags that have come from the CFIHOS standard selected and loaded in the A1. Beyond that and the breakdown structure (e.g.: area, unit) the project governs the engineering disciplines and issue purpose for the project documentation. In the last part of the AVI, you can see it all coming together, the RDL selection as part of the authoring function, maintaining and supporting the standard selected.	…A2.mp4
https://www.dropbox.com/scl/fi/9n0qox5nd3hq9axx3ke7t/HxGN-SDx.2025.CFIHOS1.5.1-Evidence.A2.mp4?rlkey=50uoytfrg8171xw1up3t33psv&st=fwhqg6yi&dl=0	To View

Suggested Evidence:

1. Show how organization standards can be defined based on a release of the CFIHOS standard (potentially with different ones for different kinds of projects).
2. Show how a project configuration can be based on a release of the CFIHOS standard or an existing organizational standard.
3. Show how the plant breakdown structure can be defined.
4. Show how RDL items can be added for the project (e.g. new tag classes, additional properties for equipment).
5. Show how RDL items can be removed for the project (e.g. remove subsurface tag classes for chemical plants to avoid EPC confusion).
6. Show how the project standard can specify local terminology for standard items.

References:

- CFIHOS Scope and Procedure, sections 9.1, 9.2
- CFIHOS Guide for Principal, sections 3.1.2 to 3.1.5
- CFIHOS Guide for Contractor, sections 2.1.2, 2.1.3

Category A3 – Support ITT & Contract

Demonstrate how the tender and contract award process is supported, including processing of any requests for information (RFIs) allowing the potential contractors to clarify requirements and so provide a better-informed bid.

Supported: No, we don't currently have contract review and deliverables management work processes available, we are though confident our core capabilities around document submission, review and feedback can be utilized.

Software: SDx

Evidence: None

Evidence	Timestamp

Suggested Evidence:

1. Show how a work context is prepared for managing the contract (e.g. storing tender documents in a document management system, adding an entry in a deliverables-tracking application).
2. Show how the information requirements for the contract are specified (e.g. method of communication, frequency of handovers, timing for different sets of expected deliverables).
3. Show a list of companies (CFIHOS entity) that are potential bidders for this contract.
4. Show how the ITT is communicated with the potential bidders.
5. Show how bidders can get clarification on tender details (e.g. using a Request for Information process).
6. Show how bids can be submitted or stored.

References:

- CFIHOS Scope and Procedure, sections 9.1 to 9.3
- CFIHOS Guide for Principal, sections 3.1.6 to 3.1.8

Category A4 – Communicate Project Standard

Demonstrate how the principal shares the project standard with the selected contractor so that they can deliver the expected information on time.

Supported: Yes. Our project object is key to this process, tying in the contract and contractor. Whilst we repeat this, it would only need to be defined once. The project indicates the RDL you want to include, can then be shared as a spreadsheet shown in earlier categories.

Software: SDx

Evidence: None

Evidence	Timestamp
Following on from A2 where we showed the key role our project object performs, inputting the milestone dates for the expected deliverables. For this project we then define the appropriate RDL libraries – this would be done at stage A2, we are just reshowing it. Within the project we create a contract, and this holds a relationship to the contractor that was successful (external organization). Showing how easy it is to define the response days on any communication.	…A4.mp4
https://www.dropbox.com/scl/fi/bazx49u4g5omncflgduh0/HxGN-SDx.2025.CFIHOS1.5.1-Evidence.A4.mp4?rlkey=tufxymaulyytfzch2igg9lyay&st=r2zu73ua&dl=0	To View

Suggested Evidence:

1. Show how a contract is assigned to the successful contractor.
2. Show how the final set of contractual information (e.g. project RDL, design information) is shared with the successful contractor.
3. Show how dates are recorded for tracking the expected deliverables (by principal / contractor).

References:

- CFIHOS Scope and Procedure, sections 9.1, 9.4, Annex B
- CFIHOS Guide for Principal, section 3.1.9

Phase B – Contractor System Setup

Category B1 – Implement Project Standard in Creation Tools

Demonstrate how the contractor can configure any information authoring features (e.g. design tools) based on the project standard, so that the principal's requirements can be honored from the outset.

This is a preparation step for Category D1.

Supported: Yes, we have centralized mapping, ensuring that project standards are gathered at the design source and shared through into the engineering environment then available for the deliverables. For SDx, the mapping is part of the data take-on capability, ensuring the registers are provided with the information required for the project standards.

Software: SDx

Evidence:

Evidence	Timestamp
What you can see is the provided registers that reflect the project standard. In this short AVI, we introduce the concept of column headers, where we have different types. The physical columns indicate each of the input fields on the register, in addition we have computed and constant column categories. Computed columns are key to the mapping flexibility, the ability to manipulate multiple physical columns etc. We then show the configurability capability, where a new input field on the register can be mapped to a physical property in the data model. Finally showing Tag registers, we have more flexibility around capturing attributes, that allows a very flexible extension of the register via an inverted file format.	…B1.mp4
https://www.dropbox.com/scl/fi/nm24ur05x4kvq9ph57wip/HxGN-SDx.2025.CFIHOS1.5.1-Evidence.B1.mp4?rlkey=kys63dx3aprfksyy2q7am8mkh&st=if5sn5wx&dl=0	To View

Suggested Evidence:

1. Show how the contractor can use relevant parts of the project standard (e.g. discipline-document type combinations) to configure how documents are authored.
2. Show how the contractor can use relevant parts of the project standard (e.g. tag classes) to configure how data are authored.

References:

- CFIHOS Scope and Procedure, sections 9.1, 9.5
- CFIHOS Guide for Contractor, section 2.2.5

Category B2 – Implement Project Standard in Gathering and Aggregation Tools

Demonstrate how the contractor can configure the project standard into any features that are used to collate information from separate systems or from further down the information supply chain, so that this information can be mapped or transformed to what is needed.

This is a preparation step for Category D2.

Supported: Yes, the approach taken would be to use registers to capture information. It's no problem in terms of formats to capture additional attributes, there is a format that takes care of that.

Software: SDx

Evidence:

Evidence	Timestamp
Building on B1, we can see the administration tool for the set of registers. Selecting the document register we can see the set of physical columns that must exist in the incoming register (load file), some of the columns can be optional, some mandatory. For tag properties to help with maintainability and provide flexibility we have an alternative mapping capability we call "inverted". This supports the loading of new attributes without having to change any of the mappings, useful at times in the project, later validation can be added. You've seen the registers in terms of how we configure, we now show the sample Tag register, column by column, with empty fields where it's optional. The example with just five columns is the "inverted" format, then finally an example document register.	…B2.mp4
https://www.dropbox.com/scl/fi/vz4i6wv6g5vpl3ggmzw71/HxGN-SDx.2025.CFIHOS1.5.1-Evidence.B2.mp4?rlkey=bde8yfkx0fs4519b8ep5y7m7g&st=ucg2td72&dl=0	To View

Suggested Evidence:

1. Show how the contractor can configure features for processing information collected from other internal systems to make it conform to the project standard.
2. Show how the contractor can configure features for processing information collected from external information suppliers (e.g. subcontractors, vendors) to make it conform to the project standard.
3. Show how the contractor can configure features for bringing together information collected from different sources.

References:

- CFIHOS Scope and Procedure, sections 9.1, 9.5
- CFIHOS Guide for Contractor, section 2.2.5

Category B3 – Implement Project Standard in Validation Tools

Demonstrate how the contractor can configure any validation features based on the project standard, so that they can make sure the authored information conforms to the principal's requirements.

This is a preparation step for Category D3.

Supported: No.

Software: SDx

Evidence:

Evidence	Timestamp
Hexagon will support this in the future, providing evidence and updates to the submission.	

Suggested Evidence:

1. Show how the contractor can configure features for doing a quality check on the processed information (including tags, equipment, documents and relationships) before it is transferred to the principal.

References:

- CFIHOS Scope and Procedure, sections 9.1, 9.5
- CFIHOS Guide for Contractor, section 2.2.5

Phase C - Information Supply Chain Setup

Category C1 – Communicate Project Standard

Demonstrate how the contractor can share the project standard with any other information suppliers (e.g. subcontractors, vendors).

Supported: No

Software: SDx

Evidence:

Evidence	Timestamp
Hexagon will support this in the future, providing evidence and updates to the submission.	

Suggested Evidence:

1. Show how the contractor can communicate the relevant parts of the project standard to third parties.
2. Show how the contractor can give information suppliers access to a shared working environment that has been previously prepared with the project standard.

References:

- CFIHOS Scope and Procedure, sections 5.3.1, 5.3.2, 9.1, 9.5, Annex B
- CFIHOS Guide for Contractor, sections 2.2.3, 2.2.4

Category C2 – Support Information Collection and Aggregation

Demonstrate how other information suppliers (e.g. subcontractors, vendors) can communicate their information deliverables to the contractor, and how the contractor can store these deliverables so they can later be prepared for handover to the principal.

Supported: No

Software: SDx

Evidence:

Evidence	Timestamp
Hexagon will support this in the future, providing evidence and updates to the submission.	

Suggested Evidence:

1. Show how the contractor can specify to third parties what information deliverables they are expected to provide (e.g. allocating document numbers or ranges, lists of expected document types for tags).
2. Show how dates can be assigned to planned deliverables so the contractor can track progress across the supply chain.
3. Show how third parties can transfer their information deliverables to the contractor (e.g. uploading documents to a shared working environment).
4. Show how the contractor can organize the received deliverables, so they are ready to be processed for later delivery to the principal.

References:

- CFIHOS Scope and Procedure, sections 9.1, 9.5, Annex B
- CFIHOS Guide for Contractor, section 2.2.5, 2.2.6

Phase D - Contractor Information Delivery

Category D1 – Create Information

Demonstrate how the contractor authors information as documents and data, and later corrects that information in response to comments from the principal.

Supported: No

Software: SDx

Evidence:

Evidence	Timestamp
Hexagon will support this in the future, providing evidence and updates to the submission.	

Suggested Evidence:

1. Show how documents are authored in compliance with the project standard.
2. Show how data is authored in compliance with the project standard.
3. Show how relationships are specified between authored documents and data.
4. Show how review comments from the principal are resolved for documents and data.

References:

- CFIHOS Scope and Procedure, sections 9.1, 9.5
- CFIHOS Guide for Principal, section 3.2.4
- CFIHOS Guide for Contractor, section 2.2.6

Category D2 – Gather and Integrate Information

Demonstrate how the contractor prepares information deliverables for handover to the principal, integrating information they have authored or revised with information from elsewhere in the supply chain, so that a set of deliverables is ready to be quality checked.

Supported: No

Software: SDx

Evidence:

Evidence	Timestamp
Hexagon will support this in the future, providing evidence and updates to the submission.	

Suggested Evidence:

1. Show how the contractor prepares a context for assembling a set of information that will be handed over together to the principal (e.g. by assigning a status to information, by linking to a staging area in an existing system or by transferring to a separate staging system).
2. Show how internally authored information can be included in the set of information.
3. Show how information from other information suppliers (e.g. subcontractors, vendors) can be included in the set of information.
4. Show how the information from different origins is structured or classified consistently.
5. Show how relationships are defined between information from different origins (e.g. linking tags to documents).
6. Show how it is determined whether this set of information is ready for a quality check.

References:

- CFIHOS Scope and Procedure, sections 9.1, 9.5
- CFIHOS Guide for Contractor, section 2.2.6

Category D3 – Check Information Quality

Demonstrate how the contractor assesses the completeness, accuracy and contractual compliance of the information deliverables before handover.

Supported: No, we have document level compliance based on existence and status, that doesn't currently extend to data. See roadmap.

Software: SDx

Evidence: None

Evidence	Timestamp

Suggested Evidence:

1. Show how the contractor assesses the completeness of the set of information that is being considered for handover (e.g. availability of expected document types for each tag class, values defined for required tag properties, installed equipment matches expectations).
2. Show how the contractor assesses the accuracy of the set of information that is being considered for handover (e.g. tags within document content matches lists of tag-to-document relationships).
3. Show how the contractor assesses the compliance of the set of information that is being considered for handover (e.g. assigned location in plant breakdown structure is available in project standard, tag / document numbering matches project standard and within allocated ranges).

References:

- CFIHOS Scope and Procedure, sections 8.3, 9.1, 9.5
- CFIHOS Guide for Contractor, section 2.2.6

Category D4 – Transfer Information

Demonstrate how the information deliverables are transferred from the contractor to the principal.

Supported: No.

Software: SDx

Evidence:

Evidence	Timestamp
Hexagon will support this in the future, providing evidence and updates to the submission.	

Suggested Evidence:

1. Show how the contractor transfers information deliverables to the principal.
2. Show how the deliverables are linked to the appropriate project or contract.
3. Show how the contractor can confirm that the information has been transferred successfully.
4. Show how the principal knows that they have received new information.
5. Show how previously transferred deliverables can be updated with additional or fixed information.

References:

- CFIHOS Scope and Procedure, sections 9.1, 9.5, Annex B
- CFIHOS Guide for Contractor, section 2.2.7

Phase E - Principal Information Review

Category E1 – Review and Validate

Demonstrate how the principal reviews the information deliverables that have been provided by the contractor to make sure they comply with the contractual requirements.

Supported: No.

Software: SDx

Evidence:

Evidence	Timestamp
Hexagon will support this in the future, providing evidence and updates to the submission.	

Suggested Evidence:

1. Show how documents are reviewed.
2. Show how data are reviewed.
3. Show how consistency between documents and data is checked.
4. Show how reviews can be prioritized based on the criticality or priority of the information deliverables.
5. Show how review outcomes are recorded, including details of any corrections required.
6. Show how progress is tracked for schedule visibility.

References:

- CFIHOS Scope and Procedure, sections 8.4.1, 9.1, 9.5.3
- CFIHOS Guide for Principal section 3.2.2

Category E2 – Report Review Outcome

Demonstrate how the principal communicates the outcome of their review of the information deliverables to the contractor, including details of any corrections required.

Supported: No.

Software: SDx

Evidence:

Evidence	Timestamp
Hexagon will support this in the future, providing evidence and updates to the submission.	

Suggested Evidence:

1. Show how the review outcome is shared with the contractor.
2. Show how any required corrections are shared with the contractor.
3. Show how the principal acknowledges that information was delivered according to the contractual requirements.
4. Show how dates can be specified for correcting information.

References:

- CFIHOS Scope and Procedure, sections 8.3, 8.4, 9.1, 9.5.3, Annex B
- CFIHOS Guide for Principal, section 3.2.2, 3.2.3

Phase F - Principal Handover to Business Systems

Category F1 – Deliver to Business Systems

Demonstrate how the principal's project team can prepare the project information for delivery to business systems that support ongoing activities (e.g. operations and maintenance teams).

Supported: No.

Software: SDx

Evidence:

Evidence	Timestamp
Hexagon will support this in the future, providing evidence and updates to the submission.	

Suggested Evidence:

1. Show how the principal can structure a capital project so that multiple contractors can deliver the required information.
2. Show how information can be validated for handover.
3. Show how information can be handed over to operations or other non-project business systems.

References:

- CFIHOS Scope and Procedure, sections 9.1, 9.6
- CFIHOS Guide for Principal, section 3.3

Category F2 – Track and Update

Demonstrate how all deliverables are tracked and updated (including final deliverables).

Supported: No. We currently don't have a work process for deliverable tracking, we do believe this can be configured, it's not available OOTB. In most cases as described in F1, all deliverables would be brought into a project staging area, for quality and validation checks, then pushed into AsBuilt. There are exceptions where information can be delivered into AsBuilt. For handover phasing we describe this in D2 using the handover package as a vehicle. For concurrent engineering, key areas like conflict resolution are key to successful execution of concurrent engineering.

We D2 – handover package, F1 talks to the deliverables area.

Software: SDx

Evidence: None

Evidence	Timestamp

Suggested Evidence:

1. Show how as-built information can be delivered.
2. Show how handover of information can be phased (e.g. based on criticality or priority).
3. Show how delivery and handover of information can be tracked to make sure that scheduled dates are met.
4. Show how concurrent engineering issues are addressed.

References:

- CFIHOS Scope and Procedure, sections 9.1, 9.6
- CFIHOS Guide for Principal, section 3.3