Memo to:		**Memo No:**	1/2022
OCX Consortium Members		**From:**	Implementer Forum Task Group
		Date:	May 23, 2022
Copied to:		**Prep. By:**	DNV
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IMPLEMENTER FORUM - TASK GROUP REPORT

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1   BACKGROUND

The OCX Consortium agreed at the member meeting on September 1, 2021, to set up an Implementer Forum to support the implementation of the OCX standard in the industry.

An Implementor Forum (IF) is:

- an accepted instrument for ensuring the interoperability of a standard (OCX in our case)
- a closed, competitive-free project group; no publication of explicit test results
- a neutral platform for vendors and tool-providers for testing and exchange of experiences in an atmosphere of trust (secured by a non-disclosure agreement)
- Test rounds are performed on test models covering existing user requirements and use cases
- The aim is to assure and push the application of a standard through documentation of interoperability
- The IF provides a regular update to the industry on the state of the interoperability of a standard by publishing an agreed set of quality measures for each use case that has been tested

The overall goal of the Implementor Forum is to provide trust in the standard and maintain trust over time by ensuring standard interoperability between stakeholders.
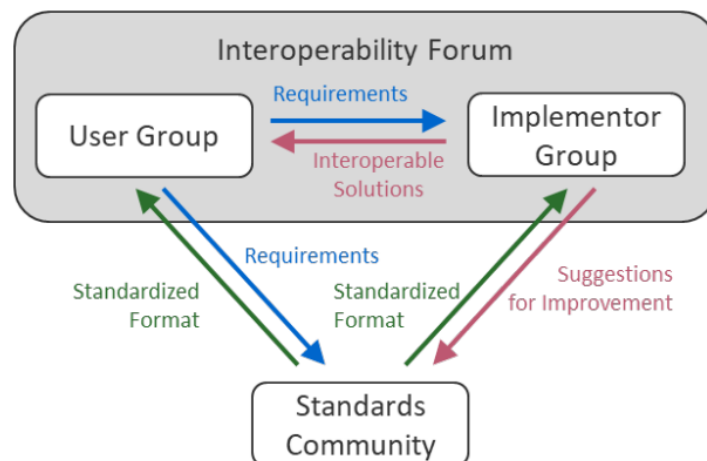

Figure 1: The relationship between the three stakeholder groups part of implementing/maintaining the interoperability of a standard

An implementer forum typically consists of a group of software vendors, 3rd party integrators, independent implementors and users who validate recommended practices in test rounds based on prioritized use cases defined by the user group.

The main benefits of setting up an IF are:

- Testing in a closed, trusted environment
- Early detection of errors leads to faster development cycles
- Beta-testing with other systems enhances product interoperability and robustness even before production release
- User requirements can be communicated, and common implementation approaches agreed.
- Stability of new capabilities
- Early feedback on requirements on the feasibility and the timeframe for support in various tools

2   THE TASK GROUP

2.1   Task group mandate

The OCX Consortium decided at the meeting on September 1, 2021, to establish a small task force that will be responsible to work out the details for the implementor forum organisational model. This will also include a more detailed description of the cost involved in setting up and running the forum.

The TG was given the following mandate:

> **Prepare the decision basis for the OCX Consortium Members for setting up and running the OCX Implementer Forum**

2.2   Task group members

The Task Group (TG) is formed by the following six members:

1   **DNV** - Group lead (Ole Chr. Astrup
2   **BV** (Hugues Moreau)
3   **Chantiers de l'Atlantique** (Toni Bars)
4   **PROSTEP** (Mathias Grau)
5   **SSI/NDAR** (Nick Danese)
6   **NAPA** (Mikko Forss)

2.3   Task group meetings

The TG has met 5 times in total on the following dates:

1.   2021.10.19
2.   2021.11.09
3.   2022.03.23
4.   2022.04.22
5.   2022.04.27

In-between meetings there has been e-mail correspondence working out the basis for this report.

3   OCX SCHEMA OWNERSHIP, LICENSE AND SCHEMA EVOLUTIONS

3.1   Ownership & license

The OCX ownership has been transferred from the APPROVED JIP participants to the OCX consortium to be jointly owned and managed. This happened with the forming of the consortium and signing of the consortium agreement. The OCX schema version 2.86 published by the APPROVED JIP in June 2021 has been taken over by the Consortium and is available on the consortium website (https://3docx.org/published-versions). This schema version is the starting point for all subsequent schema evolutions managed by the Consortium.

With the agreement it was also decided to provide the OCX schema with a public license under the Open Source Initiative, The Apache 2 Public License was chosen as the licensing model, see also https://3docx.org/legal-notice. The license provides anyone with a royalty-free right to use and derive artefacts based on the schema for any business purpose as long as the usage and artefacts follow the terms given by the License.

3.2   Schema maintenance

The role of the Consortium is to promote, maintain and publish the OCX schema and related documentation. An Implementor Forum will fall under the schema maintenance activities. The role of the OCX Consortium will be to set up necessary maintenance activities and propose a financing model for such activities to ensure continuous maintenance of the schema.

The OCX Full Member group is jointly responsible for the governance of the OCX schema evolutions. The governance model is regulated BY the OCX Consortium Agreement.

3.3 Schema development

Further development of the schema will have to be undertaken and financed outside the Consortium by an individual or joint initiative. Such initiatives can come from Consortium member companies or companies outside the Consortium. In both cases, all schema changes or enhancements have to be approved by the Consortium to become part of the official version of the schema governed by the OCX consortium. This will be part of the natural OCX schema evolution.

4 OCX IMPLEMENTER FORUM

4.1 Definitions

Term	Definition	Comment
OCX Member	A member of the OCX Consortium	Corresponding to the Standards Community in Figure 1
IF Participant	A participant in the Implementor/Interoperability Forum	Either part of the User or Implementor Group, Ref Figure 1.

IF participants will have to share the cost of running the Implementer Forum, see Section 4.6.

4.2 Organisational models

It was agreed at the meeting on September 1, 2021, to evaluate two alternatives for organising an Implementer Forum (IF):

1. The IF is controlled by the OCX Consortium utilising only its resources
2. The IF is controlled by the OCX consortium utilising its resources if available and hiring missing expertise

The Consortium Members clearly stated that the Consortium need to control the IF. According to PROSTEP this is independent of the proposed models. Full control by the Consortium may also be possible if the IF should be run by PROSTEP IVIP, it will depend on who pays the costs. In any case, it was decided at the Full Member meeting that the task group shall evaluate the two alternatives listed above.

4.3 Cost groups

The costs for setting up and running an Implementer Forum can be divided into three groups:

1. Ramp-up costs: This is a one-time cost for setting up and establishing the IF. This includes the work to write the implementation guideline document and agree on format specifications and test process.

2. Per annum fixed costs: This includes the project management and facilitation of the IF activities involving writing the test documentation, test model documentation and test model creation. organising the test rounds, collecting the results, analysing the results, writing up the test report, and publishing work. If there are schema changes, the implementation guidelines must be updated.

3. Per annum variable costs: The variable costs depend on the use cases and the test scope, i.e., the number of test models covering the use cases, number of test participants (export and import) and number of test rounds.

4. Infrastructure costs: Infrastructure platform for hosting working documents (test documentation, guidelines, test data, results, minutes…), tools for test evaluation (can be Excel) and tools for checking test files for syntax, structure, and contents (i.e., quality).

4.4 Typical implementer forum tasks

The typical IF tasks are:

Task	Description
Project Management and facilitation (PM)	Leading all IF tasks. Reporting to OCX Consortium Full Member group

PR (publish results)	Publishing of test results for each use case and each export/import case
Test Facilitation	Facilitation of test rounds between all IF participants
Test Documentation	Documentation of each Test round. Identification of test metrics and reporting
Implementation Guidelines	Guidelines on how to implement different aspects of the schema to ensure consistent interpretation and results across all SW tools.
Test Model Documentation	Documentation of the test model in a way to make it reproducible by any CAD system
Test Model Creation	The effort necessary to natively create each 3D model in the different vendor CAD systems

Table 1: Implementer Forum Tasks

4.5   In-kind Contribution by Consortium Members

The consortium members can in principle fill all the required tasks required to set up the Implementer Forum, from project management and facilitation to model creation, testing and evaluation. The task that will require the most effort by only one contributor is the IF leadership and facilitation as this cannot be shared across IF participants.

The tasks that require subject matter expertise from the IF participant and, hence, cannot be outsourced, are listed below:

Task	SM expertise effort %[1]	Hired in effort %[1]	Comment
PM		15	Leading IF tasks
PR		10	Publish test round results
Test Facilitation		15	Facilitation of test rounds
Test Documentation	20		Update of test documentation
Implementation Guidelines	20		Update of guidelines
Test Model Creation/Updates	20		Update of test model and documentation
Total	**60**	**40**	

Table 2: IF facilitation and SM expertise task split. Only recurring activities are shown

The above table shows that three tasks do not require SM expertise (PM, PR, and Test Facilitation) and can be hired. The total effort for the facilitation tasks is approximately 40-50% of the total yearly effort running an Implementer Forum. IF leadership and facilitation is not a small effort and falls on a single role and we cannot expect a single IF participant to provide this function as an in-kind contribution. Therefore, these costs must be shared between each IF participant and covered as a cash contribution independent of the choice of the organisational model.

4.6   Cost estimation

The estimated running costs for the Implementor Forum: 50 K€ per year.

The estimate is based on the experience of running several implementer forums as part of PROSTEP VIP. It is important to note that the first project year may require additional funding to cover the ramp-up cost. The gross estimate for the costs for setting up and running an IF was presented at the Full Member meeting on Sep. 1. by PROSTEP. The estimated costs for running an IF of a size fitting the Consortium needs are assumed to be 50 k€ per year. Infrastructure costs can be kept low by utilising open-source solutions (e.g. DokuWiki, GitHub). The final solution must be sized based on the number of IF participants and test scope.

The cost estimate is based on running an IF with 12-15 participants and an approximate activity level as described in Table 3:

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[1] The effort is given as a percentage of total yearly effort.

Description	#	Comment
Implementor Group	10	5 CAD vendors, 5 classification societies
User Group	3-5	From any OCX Member (designer/yard, vendor, society etc.)
Number of test rounds per year	2	All use cases with model export and import are tested each test round
Number of Use Cases	2-3	Number of uses cases when IF is fully implemented
Number of CAD models to maintain	2	One CAD model may support several use cases

Table 3: Implementor Forum target size and expected activity level

Example:
1. The cost for running the IF is assumed to be 50 k€ per annum.
2. 50% of this cost is incompressible and must be provided in cash, see Section 3.5
3. A recommended minimum number of IF participants is 10
4. The cost per participant will then be 50 k€/10 = 5 k€ per annum
5. A participant with the capacity for in-kind work may provide their 5 k€ payment as two contributions: for example, a split of 2.5 k€ in cash and 2.5 k€ as in-kind.

20 IF participants will reduce the participation fee to 50/20 = 2,5 k€ per annum.

5   PROS & CONS - ORGANISATIONAL MODELS

5.1   Model 1

Pros	Cons
This will lead to the lowest cost share as all work will be provided in kind.	The facilitator effort is large, and it is unreasonable to believe an IF participant will take on this without any monetary compensation
	Leading and facilitating the IF will require experience, which we might not find with any of the OCX members
	Some IF participants may not have the capacity or SME to provide any in-kind contribution but still want to be part of the IF. It will be unfair to the large in-kind contributors if these participants join the IF for free.
	Leading the IF by one OCX member may bias the tasks and hence potentially lead to a conflict of interest
	The OCX consortium will have to provide the IF collaboration infrastructure. These costs have not been estimated.
	It may take a longer time to ramp up as the IF facilitator has not done this before

Table 4: Pros & Cons IF organisational model #1

5.2   Model 2

Pros	Cons
Outsourcing the IF facilitation guarantees that we have the right expertise	Will invoke outsourcing costs and an IF fee.
Outsourcing facilitation can provide a more neutral outcome and overcome the potential conflict of interest	It still requires overseeing by IF participants
Outsourcing the IF infrastructure is an option	
Shorter time to get the IF up and running	

Table 5: Pros & Cons IF organisational model #1

5.3   Decision model

The IF decision model must be agreed on. The TG proposes to use the same voting system as regulated by the OCX Consortium agreement: 2/3 voting majority for decisions.

6   IMPLEMENTER FORUM USE CASE DEFINITION

6.1   Use case selection

This is the most important task for the OCX members to agree on. A use case will define the data exchange scenario and place it in a context where the business value can be identified. The members will have to agree on the use cases we want to cover. The Task group can discuss and come up with a proposal for the OCX members making the use case selection easier. The classification societies will have to play an important role in defining the use cases. But other use cases outside the scope of classification may also be of value.

The current schema version does not have support for all the information requested by the class, for example, the loading information. But the TG proposes to not include missing information items due to limitations in OCX V2.8.6 now. This information will have to be addressed at a later stage as separate schema evolution.

6.2   Information requirements

The classification societies have documentation requirements including guidelines to help designers/yards to provide the necessary design documentation for a new-building project. These requirements and guidelines are related to the current practice for design documentation as structure drawings and supplementary documentation made by the designers/yards. By using these requirements/guidelines the TG has identified the information to be included in the OCX model given the use objective and scope.

6.3   The proposed use case

The TG proposes to use a merchant cargo vessel without too complex geometry as the basis for developing the use case model. Also, the availability of a model which can be shared between all stakeholders is important. NAPA agreed to provide their VLCC demo model for the IF use case.

To limit model size and complexity we also propose to only include the cargo hold area in the OCX model. To further limit the model size, we believe it will be sufficient to only include 1 cargo hold. Partial model direct strength analysis (FE) requires a 3-hold model of the cargo area. This use case may be covered at a later stage.

Prerequisites:	OCX model based on current schema capabilities (V2.8.6)
Use case title:	Longitudinal Strength
Use case objective:	Assess the longitudinal strength of the vessel according to the classification society's rules.
Model sub-division;	Cargo hold area, 1 hold

The OCX model must include the information needed by the society to be able to fulfil the use case objective, see Section 6.4 Use case information requirements.

6.4 Use case information requirements

Info codes:

AP	For approval
FI	For information

The table below lists all requirements related to the hull discipline necessary to fulfil the use case objective for the selected use case. The 3D OCX model must include all the identified information requirements. Items marked with FI (For Information) will not be required as part of the model exchange.

Object	Documentation type	Additional description	Info	OCX V2.8.6
Ship hull structure	Design load plan	A drawing showing: deck uniform (lay-down) loads major loads from heavy equipment, e.g. modules, cranes, winches, life boat structures, flare towers, risers helicopter loads, landing and parking. For vessels that may take vehicles on board, as cargo or for cargo handling: types of vehicles that can be accommodated, including arrangement of axles and wheels, maximum axle loads and details of wheel and foot print arrangements stowing plan including the most unfavourable combination of vehicles that may be positioned on deck. For vessels where block loading block loading is included in the loading manual (H110/H111): extent and magnitude of allowable block loading distributed loads.	FI	No
	Tank and capacity plan	A plan of the vessel with location and identification of spaces and tanks. Information about content, density, volumes, equipment weight, centre of gravity and liquid temperature for all applicable spaces and tanks. Tank loading criteria for all tanks, including a description of the loading system, with: loading arrangements height of air pipes loading dynamics densities tank testing pressures.	FI	Yes, Except item 1,3
	Structural drawing	Decks and inner bottom. A drawing showing the geometric dimensions, scantlings and arrangement of a structural object, including: details of parts and openings material specifications (see M010 or M030) standard details (see H070) details of joints, welding procedures, filler metal particulars and specification of heat treatment after welding inspection category, if not default category procedure for stress relieving of cast steel parts.	AP	Yes except item 3,5,6 and welding

	Structural drawing	Transverse bulkheads. A drawing showing the geometric dimensions, scantlings and arrangement of a structural object, including: details of parts and openings material specifications (see M010 or M030) standard details (see H070) details of joints, welding procedures, filler metal particulars and specification of heat treatment after welding inspection category, if not default category procedure for stress relieving of cast steel parts.	AP	Yes except item 3,5,6 and welding
	Structural drawing	Longitudinal bulkheads. A drawing showing the geometric dimensions, scantlings and arrangement of a structural object, including: details of parts and openings material specifications (see M010 or M030) standard details (see H070) details of joints, welding procedures, filler metal particulars and specification of heat treatment after welding inspection category, if not default category procedure for stress relieving of cast steel parts.	AP	Yes except item 3,5,6 and welding
	Midship section drawing	A drawing of the midship transverse section providing information of geometric dimensions, scantlings and material specifications. The following information shall be included on the drawing: length of ship L greatest moulded breadth B moulded depth D mean moulded summer draught T block coefficient CB maximum service speed V class notations.	AP	Yes
	Shell expansion drawing	A drawing showing the shell expansion including load and ballast water lines and the extent of the flat part of the bottom and sides. The drawing shall include geometric dimensions, scantlings and material specifications. The bilge keel and its connections to the hull shall be included.	AP	Partly. Load and ballast water lines are not supported.
	Framing plan	A drawing showing the positions and type of stiffeners and primary support members. The drawing shall include geometric dimensions, scantlings and material specifications. The framing plan is normally a part of the shell expansion drawing (H060).	AP	Yes
	Longitudinal section drawing	A drawing showing the structural arrangement of primary support members and stiffeners parallel to the vessel's centerline. The drawing shall include geometric dimensions, scantlings and material specifications.	AP	Yes

	Standard details	A yard standard (booklet) provides drawings of standard details used in the structure. The corresponding details should be identified on the structural drawings (H050).	FI	No

Table 6: Documentation requirements for the selected use case

6.5   3D model documentation

NAPA has offered the IF to use their VLCC demo model to support the selected use case.

- Ship type: VLCC
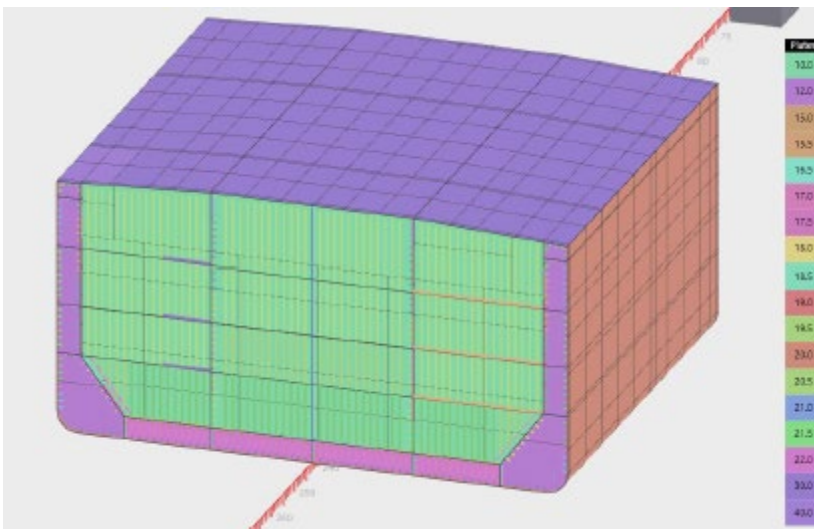- Model extent: one cargo hold area (+/- 1#)

Figure 2: NAPA 1 cargo hold model demo VLCC

The recommended best practice is to manually recreate an identical model in each CAD System based on the drawings to ensure an identical and error-free model.

NAPA will provide the following source data for model creation:

- Drawings with dimensions and scantling information
- OCX file of the model (for reference)
- IGES and HTML export of the model (for reference)
- NAPA database (for reference)
- Test model to be used for the "Longitudinal Strength" use case