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Ship Lifecycle Software Solutions (SHIPLYS)

Project Deliverable Report

D9.6 SHIPLYS Training Strategy

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Editor:	Yili Wang (AES)
Contributors:	Andreas Roppelt (AES), Konstantin Kreutzer (AES), Arijana Milat (AS2CON), Darko Frank (AS2CON9, Ujjwal Bharadwaj (TWI), Boris Rodov (LR), Haibin Wang (UStrath), Yordan Garbatov (IST), Aaron Schultz (BMT)
Internal reviewers:	Yili Wang (AES), Thomas Koch (AES), Alfonso M. Carneros (SOERMAR), Cayetano Hoyos (SOERMAR)
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EXECUTIVE SUMMARY

This document defines the Training methods to be applied for familiarising end-users of the SHIPLYS platform with all functions and tools that are in scope for the typical early design scenarios selected for this project.

The document focusses on the training requirements as determined by earlier investigations and consultations with the ship design and shipyard end-users.

Both the engineering and the administrative perspective are discussed.

Apart from looking at the specific aspects related to the functions of the SHIPLYS platform, each of the design tools included in the demo scenarios is considered.

Finally, a plan for the implementation of the training strategy is provided.

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ABBREVIATIONS

BHP	Brake horse power
CAFE	CAD to FEM
CAPEX	Capital Expenditure
CoG	Centre of Gravity
DW	Deadweight
EEDI	Energy Efficiency Design Index
GUI	Graphical User Interface
IGES	Initial Graphics Exchange Specification
JRE	Java Runtime Environment
LCA	Life Cycle Assessment
LCCA	Life Cycle Cost Analysis
LCT	Life Cycle Tool
LR	Lloyd's Register
LW	Lightweight
MCDA	Multi Criteria Decision Analysis
OPEX	Operational Expenditure
OS	Operating System
PPT	Production Planning Tool
RIT	Requirements Identification Tool
RSET	Rapid Ship Evaluation Tool
STEP	Standard for the Exchange of Product model data

1 Introduction

This Deliverable lays out SHIPLYS strategy for software training.

The following sections provide the background to the training approach, key aspects relating to the SHIPLYS platform services to be covered in the training and the strategy to impart this training. The general concepts of the training method will follow the “Design backwards, Deliver forwards” principle. The aim is to achieve maximum impact in terms of uptake of the SHIPLYS software by SME shipyards.

2 General Concepts of Training Development

Leaning on the "Design backwards, Deliver forwards” [1] principle, the concept of SHIPLYS software training suggests that learning experiences should be planned with the final assessment in mind.

The concept of backward design requires a clear definition of the content in regard of its effectiveness in achieving learning objectives.

The premise of “design backwards” is to allow the vision of desired results to shape methods and materials used in teaching sessions. It requires a shift in thinking first about the specific learning outcomes and the evidence of such learning prior to integrating the role and function of the teacher and activities.

Design Backwards should contain the following three Phases:

1. <u>Definition/Identify desired results</u>

The design of all software training should start by identifying the desired outcome of the training (“Where do I want students to be by the end of the training course?”).

Following a specific process, this phase requires the instructor to identify specific skills that students should master.

In this phase the acquired knowledge is classified as:

- **Factual**, what content will students need to be familiar with
- **Procedural**, what procedures, techniques or methods will they need to know
- **Strategic,** what strategic knowledge or higher-order thinking skills should students develop

This includes software specific skills as well as training achievements that apply in general, such as:

- The trainees should be aware of the main advantages of the provided software in order to be motivated to learn how the software works. This should include reminding the trainees of the functionality requirements they presented in “SHIPLYS end-users requirements to inform software development” [2] before the actual training session starts.
- The trainees should become aware of provided support in order to avoid that in case of bugs or missing functionality time-consuming and insufficient own solutions are developed instead of contacting the developers.
- By the end of the training, participants should have gained a good understanding of software specific concepts and functionality as well as a sense of context regarding the SHIPLYS platform and its design processes.

- Participants should be able to work through use cases that reflect typical real life tasks.

2. **Determine acceptable levels of evidence that desired results have been accomplished (culminating assessment tasks)**
   - Trainees are able to use the provided software alone for the defined use cases.

3. **Training activities that will lead to desired results, such as**
   - Make trainees aware not to hesitate regarding any feedback and required support. Each feedback helps to develop and improve the software further.
   - General explanation of the software functionality and main advantages.
   - Explanation of how the software has to be installed.
   - Working through the relevant use cases defined in D8.2 SHIPLYS good practice guide [3].
   - Provide appropriate documentation, such as user manuals.

3 Special Requirements and Challenges

When developing training material for SHIPLYS software components and framework administration, several aspects have to be considered. As an example, some of the software components will still be in prototype state (pre-alpha versions) and have not yet passed sufficient hours of real life testing. Possible side effects of this are unexpected bugs, crashes and malfunctions. Those events should be expected and appropriate countermeasures should be taken. Those measures could include the preparation of substitute pcs/installations and videos/slides as fall-back options.

Another aspect is that SHIPLYS components are part of a network based framework and as such inherently depends on intact network connections and availability of required components. Actions depending on network traffic can become lengthy or even fail in training situations.

The same applies to training sessions that should be held via web conferences. Additionally, technical problems of the presenters and/or participants could lead to serious delays or even failures of the training. Alternative options, such as workshops, where end users could share experiences and unify practical methodologies in the first use of SHIPLYS tools should be considered as well.

Starting from the requirements of the rapid prototyping tools the primary OS platform to be used for the training sessions is MS Windows whereas the SHIPLYS Framework is platform-independent.

4 SHIPLYS Platform Concepts Training

In contrast to monolithic software components, the use of software included in SHIPLYS requires not only knowledge and understanding of single software component but also of the SHIPLYS framework and its underlying concepts and ideas. These ideas and concepts must be subject of dedicated training sessions that include at least the following aspects:

- **Designing guided by activity model**

    - The design process is following a defined process model which allows dependency analysis, documentation and clear overview of the design process state.
- **Controlling of design process**
    - The design process is actively controlled by design team members using the workflow controller component which can derive possible next steps as well as available and necessary input data.
- **Design State**
    - Due to the combination of a common data model and the process model, the state of the design process can be derived at all times from the available data.
- **Correlation of software tools with design activities**
    - Every design activity can be carried out by one or more software components. This simplifies and accelerates the design process.
- **Common Data Model**
    - By using a common data model, generated data can be effectively reused among different software components. This resolves incompatibility issues and allows a much more fluent design process.
- **Loosely coupled framework of several services & clients**
    - Due to its loose client/service architecture, the SHIPLYS platform is highly customisable and expendable.
- **Platform Independency**
    - The usage as well as the components of SHIPLYS framework is platform independent. This is a significant advantage when it comes to multi-location/multi-organisational framework setups.
- **Network-based**
    - The SHIPLYS framework is based on network traffic and can be set up with world-wide distributed components.
- **Authentication and Security**
    - All users should be aware of user authentication and the fact that data transport is secured.

This kind of training is necessary for end users and administrators.

5 SHIPLYS Platform Administration Training

SHIPLYS framework administrators must additionally be trained in how to:

- **Register services, clients and users:**
    - Since SHIPLYS framework is based on user / connector authentication mechanism, the management of those must be handled by authorised and skilled persons.
- **Management of user rights**
    - Administrators must be familiar with assigning and revoking rights to/from specific users.
- **Service administration**
    - Administrators of specific services should be trained in specific administration functions of the services.
- **Certificate revocation**

- Administrators should be able to revoke certificates or request the revocation of certificates.

6 Software Components Training

Trainees will have the opportunity to train on the SHIPLYS software described in the following chapters. The training can be carried out primarily by considering the third step of the “Design backwards, Deliver forwards” described above. The first and second step of that principle is general and therefore applies to all software components. Furthermore, existing training documents can be referred to.

6.1 Workflow Controller Training

Based on the third step of the “Design backwards, Deliver forwards” principle the training for the **Workflow Controller** is carried out as described in the next section, beginning with a summary of the functionality and advantages, how to install and start the tool and the use cases to be covered during the training session.

6.1.1 Functionality and advantages

Table 1: Functionality and advantages of Workflow Controller

Functionality	Advantage
Provides an overview of the current state of design activities.	Planner and designer can keep track regarding the current state, next activities to be carried out, already available and missing data.
Allows starting new design activities based on available data and registered software components.	Speeds up the design process, simplifies overview
Allows complete design process documentation.	Allows analysis and reuse for future projects/ employee trainings

6.1.2 Installation and Starting Workflow Controller

This component is still under development. Therefore, the installation procedure will be given later in the project.

6.1.3 Use Cases

The following use cases defined in deliverable 8.2 are used for training purposes:

- Retrieve information of already carried out activities and the related data being produced
- Retrieve information of the current activity or activities to be carried out as next and the required input data

6.2 Requirements Identification Tool Training

The conception of the training for effective usage of the **Requirements Identification Tool** (RIT) should consider all aspects that are described in this chapter.

6.2.1 Functionality and advantages

The following table summarises the main functionality and its advantages of Requirements Identification Tool:

Table 2: Functionality and advantages of Requirements Identification Tool

Functionality	Advantage
Requirements and task definition based on provided owner documents like tender or specification, which can be directly imported into the tool.	Based on these documents requirements and tasks can be defined rapidly whereas predefined templates and historical data can be used.
All the data regarding requirements and/or tasks are stored and linked to the related owner documents.	Documents can be viewed easily any time for further details.
The rapid task definition supports production planning during the early ship design stage.	Helps to make better estimations regarding project costs and supports in this way the bidding process.

6.2.2 Installation and Starting RIT

The provided RIT installer represented by a ***jar*** file has to be executed to start the installation process. Afterwards the installation instructions within dialogues have to be followed.

Requirements: Java Version 1.8.XXX JRE (Java runtime environment) or higher.

Running: Click the desktop icon or select the menu entry of the application created during the installation to start the application. After the application has been installed it can also be started from the SHIPLYS framework.

6.2.3 Use Cases

The following use cases defined in deliverable 8.2 are used for training purposes:

- Definition of task catalogue containing shipyard specific predefined task definition which can be reused
- Importing documents and definition of requirements and tasks
- Definition of tasks using the task catalogue

6.3 ConceptSHIP Training

ConceptSHIP is a software tool for the early stages of ship design: concept design and basic design. The tool is implemented as an add-in to Excel® spreadsheet.

This software tool can be used either in the initial dimensioning of a merchant ship or in the analysis of the round-trip voyage of one specified ship.

The training will be composed of three main parts:

1. Installation of the software
2. Presentation of all the functionalities included
3. Tutorials – work examples carried out by the trainees

In the first part it will be explained how to install the ConceptSHIP add-in on a computer with Microsoft Excel already installed (version 2013 or later).

In the second part, all the functionalities of the system will be detailed in a presentation by the tutor, discussing the input data required (optional or mandatory) and the results obtained. For each functionality, it will be given a brief description of the methods or algorithms used and the limitations of the implementation. The trainees will learn the proper sequence of the operations

and how to add or remove components of the ship model developed. A copy of the presentation will be delivered to the trainees.

Finally in the third part, the trainees, under the supervision of the tutor, will carry out the concept design of one or two different ships. For this purpose, the trainees will be organised in small groups of two or three persons each. At the end of the exercise, the results of each group will be presented and discussed by all groups.

6.4 RSET Training

As third step of the 'Design backwards, deliver forwards' approach, the following **RSET** training details list a summary of main RSET functionality and advantages, followed by installation and launching instructions, and finally an outline of the main use cases for RSET.

6.4.1 Functionality and Advantages

The following table summarises the main functionality and advantages of RSET:

Table 3: Functionality and advantages of RSET

Functionality	Advantage
Hull form, bulkhead, deck, and superstructure import or generation	Enables usage of existing hull form for general arrangement, and rapid generation of bulkheads, decks, and superstructure within hull to create compartments for the housing of chambers
Chamber creation or import	Allows a user to list and detail chambers for automatic arrangement within the ship compartments
Definition of constraints for chamber placement	Allows the user to limit or specify placement of specific chambers to meet design requirements of the general arrangement solution
Automated general arrangement of chambers	Automatically produces general arrangement of chambers within ship compartments while satisfying user constraints
3D representation of general arrangement	A visual representation of the general ship arrangement allows rapid inspection and evaluation of various constraints and designs

6.4.2 Installation and Starting RSET

RSET can be installed locally by using the RSET installation wizard ***jar*** file.

Requirements: Java Version 1.8 JRE (Java Runtime Environment) or greater.

RSET can be launched from within the SHIPLYS framework GUI or independently by running the RSET executable jar directly or via the start menu shortcut created during installation.

6.4.3 Use Cases

- Navigating the interface and 3D view and opening an existing project
- Importing/editing a hull form

- Generating or importing bulkheads, decks, and superstructure
- Creating or importing chambers for arrangement
- Creating chamber placement constraints: Onboard position, proximity, and relative position constraint editors
- Initiating search for a general arrangement solution
- Exporting/saving design elements or entire general arrangement

6.5 CAFE Training

6.5.1 Functionality and advantages

The following table summarises the main functionality and advantages of **CAFE**:

Table 4: Functionality and advantages of CAFE

Functionality	Advantage
Fast modelling capabilities	The innovative features enable faster and easier user interaction which brings considerable time saving during the modelling.
Hull form generation	Fast generation and manipulation of complex surfaces, along with an option of creating hull forms from imported hull lines
General arrangement	It has the capability of automatic generation of classification drawings.
Compartment definition	Easy interactive compartment definition
Hydrostatic calculations & loading conditions	Fast basic hydrostatic calculations and creation of ship loading conditions
Weight and centre of gravity determination	Automatic calculation of weight, lightweight distribution and CoG
Bill of materials	Automatic generation of bill of materials
Main equipment data sheets	Using the capability of importing the equipment models, CAFE can easily list all the equipment used in the model, with corresponding properties of mass, centre of gravity, boundary, etc.

6.5.2 Installation and Starting CAFE

The installation of CAFE application is based on following the steps in the CAFE Setup Wizard which is provided within the installation files.

Requirements: Microsoft .NET framework

Running: The application can be run by selecting the CAFE icon in the SHIPLYS framework (GUI). As a standalone application, it can be run by a desktop icon or selecting the menu entry of the application created during the installation.

6.5.3 Use Cases

The following use cases are used for training purposes:

- Introduction to the CAFE Graphical User Interface
- Basic modelling operations
- Import of geometry into CAFE
- Materials, plate and girder definitions
- Adding/importing the equipment
- Calculating mass and centre of gravity
- Generating the Bill of Materials
- Generating the List of Equipment

6.6 Lloyd's Register – SEASAFE Training

The following **SEASAFE** training details list a summary of main SEASAFE functionality and advantages, followed by installation and launching instructions, and finally an outline of the main use cases for LR SEASAFE.

In particular, LR SEASAFE is used for the concepts described in A1222-Create preliminary general arrangements of the Master Matrix and in more detail in: A12221-Define compartments (A122211-Define compartment arrangement, A122212-Define non-structural bulkheads, A122213-Define compartment properties, A122214-Define space product structure) and A12224-Calculate stability and trim (A122241-Define loading conditions, A122242-Check intact/damage stability, A122243-Calculate trim).

6.6.1 Functionality and advantages of LR SEASAFE

The following table summarizes the main functionality and advantages of LR SEASAFE that can be covered by the training:

Table 5: Functionality and advantages of LR SEASAFE

Functionality	Advantage
Fast modelling capabilities	Rapid graphics-driven interactive modelling of 3D models for any type of the vessels for the purpose of statutory assessment concerning trim, stability and longitudinal strength, covering conventional mono-hull ships /catamarans/trimarans and offshore structures such as semi-submersible / jack-up rigs etc.
Hull form generation	Generation and manipulation of complex shapes, along with an option of creating hull forms from 3rd-party tools by importing hull lines from LINES/BODY plans, or complete hull surfaces from IGES/STEP files. Also, rapid modelling of appendages and spaces open to sea such as sea chests, thruster holes, anchor pockets, etc.
Compartment and Superstructure definition	Rapid and interactive compartment definition reusing the already defined hull form, decks

	and longitudinal/transverse bulkheads as constraints. Also, defining the superstructure and compartments from basic and complex parametric shapes.
Loading conditions	Choice graphics-driven or table-driven tools covering all aspects of vessel operation tailored to the type of the vessel (container ship, heavy lift vessel, anchor handling tug supply vessel, jack-up rig etc.).
Advanced hydrostatic calculations including deterministic and probabilistic damage stability	All intact and damage stability requirements are covered including specialist calculations such as Grain Shift Moments Automatic generation of damage cases and stability criteria covering all current regulations for all types of vessels. Probabilistic calculations automatically define penetration depth and other parameters based on the existing definition of the hull and compartments. Auto-generation of 2D or 3D wind surfaces including full support for 360 degree stability calculations required for non-conventional vessels and offshore semi-submersible and jack-up rigs.
Production of Trim and Stability Booklets	Automatic generation of rich content Trim and Stability Booklets and Marine Operations Manuals complete with respect to all regulations and class-requirements for any type of vessels.

6.6.2 Installation and Activation of LR SEASAFE

The installation of LR SEASAFE software is done by following the steps in a wizard-type LR SEASAFE installation application that follows the familiar MS Windows standard.

The LR SEASAFE software can be run by selecting the LR SEASAFE icon in the SHIPLYS framework (GUI). It can also be run as a stand-alone application via a desktop icon or by selecting the corresponding entry in the Windows Start menu, both created during the installation.

Once installed and launched for the first time, the software needs to be activated with a licence (temporary licence will be provided for the purpose of the training).

6.6.3 Use Cases

The following use cases are used for training purposes:

- Introduction to the LR SEASAFE Graphical User Interface
- Basic modelling of hull and compartments in LR SEASAFE from scratch
- Import of 3rd-party geometry hull and compartment definitions into LR SEASAFE

- Definition of Loading Conditions for the type of the vessel of interest
- Setting up basic deterministic and probabilistic calculations
- Producing a basic Trim and Stability Booklet

6.7 LR RulesCalc Training

RulesCalc is used for the concepts described in A1224 - Create preliminary structure design of the Master Matrix and in more detail in: A12241 - Calculate longitudinal strength, A12242 - Define midship section scantlings, A12243 - Define other transverse sections scantlings, A12244 - Carry out preliminary superstructures structural design.

6.7.1 RulesCalc Coverage

RulesCalc covers:

- Longitudinal Strength Assessment (hull bending and shear strength, buckling)
- Ultimate Strength Assessment
- Structural Rule Requirements

For the following Structural Regions:

- Midship Section and Cargo Region
- Longitudinal primary and secondary structures
- Fore & Aft End and Machinery Space

The training that is offered covers the items of the following list:

- Getting started and Documentation (Getting Started Guide, User Guide, Practical Exercises)
- RulesCalc capabilities (integration of the classification into the design process , quick investigation of different solutions, user interface, integration with other design systems through DIME, intermediate results of rule calculations, multi-year Rule support)
- Working with the workspace
- Text and value indications (Identify Rule failures and areas of concern)
- Creating a new project
- Navigating in the software
- Adding Ship Details
- Adding Materials and Structural Elements
- Working with Spaces
- Loadings
- Global Strength
- Check Required Scantlings
- Additional Features
- Practical Exercises

6.8 LCT Training

The **LCT** training will comprise of two parts: training on the use of SHIPLYS LCT and the data exchange between SHIPLYS LCT and SHIPLYS platform.

The manual for LCA and LCCA part, developed and tested by UStrath, will ensure that the readers/end-users will be able to follow and use the related functions in SHIPLYS LCT. The

training will be based on the manual and it will not only help end users to learn the software but also provide developers with feedback to improve the software and the software manual.

The SHIPLYS MCDA module developed by TWI, as part of the SHIPLYS LCT, will follow the similar training strategy as LCA and LCCA part. User will be able to decide whether to include the MCDA module into the package.

For training on data exchange with the SHIPLYS platform, which will be a follow-up course of the training on SHIPLYS LCT use, it will cover the upload and download of data between SHILYS LCT software and the local/internet data servers. This training could be considered as part of training on the integration platform.

6.8.1 Functionality and advantages

Due to the severe competition of the shipbuilding market, the need to evaluate the shipbuilding performance has become urgent in order to provide and prove the performance of small and medium enterprises in EU. LCA is a commonly and wildly used methodology to carry out this evaluation. However, the application of LCA will require large numbers of database and modules which are designed for all industries. The application in this manner is not only requiring considerable resources but also difficult to apply and execute by ship designers, shipyards, ship operators, ship owners and policymakers during ship design and performance evaluation. The purpose of the SHIPLYS LCT software is to cut off the LCA database and modules for other industries so that the software will be focused on ship industry (ship lifespan) and the learners/end-users can save their time to carry out LCA and get the performance of ships, including the cost, environmental and risk impacts during the life phases of ship (construction, operation, maintenance and scrapping).

In addition, the MCDA module integrated within SHIPLYS LCT will guide the decision-makers to go through an appropriate decision-making process. Performance of different design alternatives can be compared wisely. Stakeholders' preference can be also incorporated. By using the MCDA module, user will have a better understanding of the impact assessment results.

Another advantage of using this software is that learners/end-users will no longer need to establish the LCA/LCCA/RA models by themselves which is time consuming, while carrying out LCA with SHIPLYS LCT software, all the models are designed and developed using general cases which means all the end-users need to do is gather information and data and feed it to the software following the ship life stages (software interface is in this manner as well) and the software will do the evaluation with the available and fed in information and data.

6.8.2 Installation and Starting LCT

Requirements: 64-bit Java for Windows version 8 Update 191 or higher

The installation of LCT application is based on following steps in the SHIPLYS LCT Setup Wizard which is provided within the installation files:

- Right click to open the installation package with the "Administrator" account;
- Select and go next based on user preference, such as language, location, create desktop shortcut, launch after installation, etc.;
- Software will be run after installation or use the shortcut/executable file to start.

6.8.3 Use Cases

The training will cover the following aspects:

- Functionality introduction

- Software installation (integrated with SHIPLYS platform or use individually)
- Carry out a full case study
- Results comparisons
- Data exchange with SHIPLYS platform

6.9 RiskSHIP Training

The **RiskSHIP** software tool allows to calculate the risk associated with a ship model and to compare different structural design solutions for the analysed vessel. This is done over two steps: the first correlates the main dimensions and ultimate strength (net and gross) to the probability of failure through the First Order Reliability Method. The second step estimates the costs of modifying the structure to estimate the reliability and the costs consequence in the case of structural failure of the vessel. The sum of these costs results in the total risk, which is the measure of the merit for the selection of the most convenient design solution.

The tool requires the implementation in Excel of the presented Add-in and the installation of the MatLab Runtime v 9.4.

The training will follow three steps:

- Tool installation
- Presentation and clarification of the processes and variables involved
- Practical exercise

The tool is based on Excel Add-ins named Matlab procedures. For this reason, the first part of the demonstration will be focused on the steps required for the tool installation.

Once the tool is functional, processes, variables and limitations involved will be presented and discussed.

Finally, one example will be conducted in groups to learn how to use the presented tool in the SHIPLYS environment and how the data model and data communication are structured. For this purpose, the trainees will be organised in small groups, of two or three persons each. At the end of the exercise, the results of each group will be presented and discussed.

6.10 Production Planning Tool Training

The **Production Planning Tool** (PPT) can be easily used in combination with the Requirements Identification Tool (RIT) by adding the related plug-in. In doing so, the defined task information using RIT can be directly used carry out further activities supporting the production planning enabled by PPT.

6.10.1 Functionality and advantages

The following table summarises the main functionality and its advantages of PPT:

Table 6: Functionality and advantages of PPT

Functionality	Advantage
Scheduler for determining the sequence of the tasks and visualisation as a Gantt Chart	Helps to make better estimations regarding project duration and supports in this way the bidding process.

Optimisation of the schedule considering limited resources	Helps to shorten the project duration and supports in this way the bidding process.
Production simulation	Provides the ability to verify the estimated data by determining more realistic project duration, resource usage and related costs.

6.10.2 Installation and Starting PPT

Installation and starting of PPT are the same as for Requirements Identification Tool (RIT) described above (please see 6.2).

6.10.3 Use Cases

The following use cases defined in deliverable 8.2 are used for training purposes:

- Scheduling of tasks
- Schedule optimisation
- Simulation of new building scenario
- Simulation of retrofitting scenario

7 Implementation of the training strategy

Following table describes the training sessions to be carried out containing information regarding software components, their main application area, software developer and the trainees to participate the training. Furthermore, a physical training session during the next Stakeholders meeting about M36 is planned. Besides, two online training sessions are planned between M30-M36 involving LINCOLN and HOLISHIP participants. For these sessions the most important use cases of each tool are trained considering the main workflow described in D6.2 showing the sequence in which the tools generally can be used.

Table 7: Summary of training sessions to be carried out

Name	Main application area	Developer	Trainee, session type
Workflow Controller	• Provides overview of the current state of design activities	BMT and AES	Online session with all partners
RIT	• Definition of Requirements and Tasks	AES	Online session with shipyards
SHIPLYS LCT	• LCA and LCCA • Risk assessment • MCDA • Data exchange with the platform	IST, TWI, AES and UStrath	Shipyards and stakeholders, during workshops
ConceptSHIP	• Ship main dimensions • LW, DW, BHP • CAPEX, OPEX • Freeboard, EEDI	IST	Online session with shipyards

	• Ship data exchange with the platform		
RiskSHIP	• Reliability based ultimate strength • Ship risk assessment • Data exchange with the platform	IST	Online session with shipyards
RSET	• Basic modelling • Evaluation of design elements and constraints • General ship arrangement	BMT	Online session with shipyards
CAFE	• Introduction to the CAFE Graphical User Interface • Basic modelling operations • Importing geometry and adding equipment • Creating SHIPLYS data file containing information on total mass, CoG, list of equipment, bill of materials	as2con and BVB (CAFE creator)	Online session with shipyards
SeaSafe	• Ship data exchange with platform • Additional basic modelling operations as well as definition of loading conditions and other supporting data, optionally for deterministic and probabilistic calculations • Producing Basic Trim and Stability Booklet based on the Ship data exchanged with platform	LR Seasafe	Online session with shipyards
RulesCalc	• Ship data exchange with platform • Longitudinal Strength Assessment (hull bending and shear strength, buckling) • Ultimate Strength Assessment • Structural Rule Requirements	LR	Online session with shipyards

	For the following Structural Regions: • Midship Section and Cargo Region		
PPT	• Scheduling • Optimisation of project schedules • Production simulation	AES	Online session with shipyards

8 References

[1] http://internal.simmons.edu/faculty-staff/general/strategic-initiatives-simmons-online/faculty-hub/designing-managing/backwards

[2] Milat A, Golik KN, editors. SHIPLYS end-users' requirements to inform software development IMAM 2017 (International Maritime Association of the Mediterranean); 2017; Lisbon, Portugal. London: Taylor & Francis Group; 2017.

[3] http://www.shiplys.com/library/deliverables/