

An Introduction to Paramarine

Design Stages

1. Identify capabilities and functions required.

These capabilities and functions must be translated into terms that can be expressed in the Design Building Block Hierarchy.

2. Place design generator Building Blocks and Equipment Items in the template design space.

These are the blocks that drive the configuration of the design. For instance, in the case of a frigate, these would be the upper deck equipment and machinery. This may not be known, so a guide is that the payload blocks should be placed first, along with any large blocks that are defined in extents, such as the accommodation.

3. Develop initial hullform.

An initial hullform can be developed using the Hull generation tools. Those dimensions not directly specified can be estimated from previous design data.

4. Initial bulkhead and deck placement.

An overall grid of bulkheads and decks can be defined based on the overall dimensions of the hullform and the locations of key items and features such as hangars or machinery spaces

5. Develop initial superstructure configuration.

With the overall arrangement and initial bulkhead arrangement defined, it is now possible to define the superstructure configuration.

6. Make initial estimate of structural weight.

With both the hull and superstructure defined, the structural weight of the vessel can be assessed. As this is the basic weight group in a ship, estimating it early in the design process can be of assistance in assessing the realism of the design.

7. Estimate tankage requirements.

With both cargo and service requirements estimated, the liquid tankage requirements can be estimated and a rough tankage layout defined.

8. Initial stability assessment.

An initial intact stability assessment can be carried out in each of the loading conditions defined in the ship design using the Early Stage Design stability objects. This is used to “flag” potential problems, such as a low GM, excessive trim or inadequate freeboard.

9. Assess current layout, dimensions, hullform, equipment fit for feasibility and integrity.

At this point, the weight in the design is equal to the displacement, but that weight may not be fully defined in that much is a single “rest of ship” weight estimated from the payload weight. This

assessment is to ensure that the dimensions, layout, machinery fit etc. are commensurate both with each other and with the performance requirements of the vessel (Powering, seakeeping, stability, personnel evolutions etc.).

Main Placeholders

1. Setup

This concept placeholder contains items that do not define the new design by themselves, but are used by the building block objects in the definition of the design. These include; weight classification systems, loading conditions, fluid densities, and libraries of equipment items. Much of the overall structure of this placeholder can be created by selecting file >> new >> early stage design.

2. Design

This is the key concept placeholder in the use of the Design Building Block approach. This placeholder contains those objects used to define the new design, including the layout grid, building block hierarchy and solid model of the ships envelope (hull and superstructure).

3. Audit

This concept placeholder contains the design audit objects used to audit the design and assess possible infringements.

4. Analysis

This concept placeholder contains performance analyses objects using the advanced analysis tools available in PARAMARINE. In our project, the analysis is limited to stability and seakeeping. However, other analyses that could be conducted within the Design Building Block approach include powering, maneuvering and radar signatures.

5. Structures

This structures placeholder contains the objects used to generate a detailed model of the structures of the vessel.

Useful Advice

1. Practice good placeholder discipline. The hierarchy pane is akin to a filing cabinet in an office. It has no default relationship to the structure of the design, but can be arranged in such a way that it does. A well structured hierarchy, where information and links flow in one direction only (generally from the top to the bottom) will be of great assistance in developing and editing designs, just as a well organised filing-cabinet is of benefit in the office.
2. Keep a text editor, such as Notepad, Word etc open when using PARAMARINE. Error messages, variable entries etc can be pasted to (and from) the text editor.
3. Read error messages. They usually help to determine what has gone wrong.

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