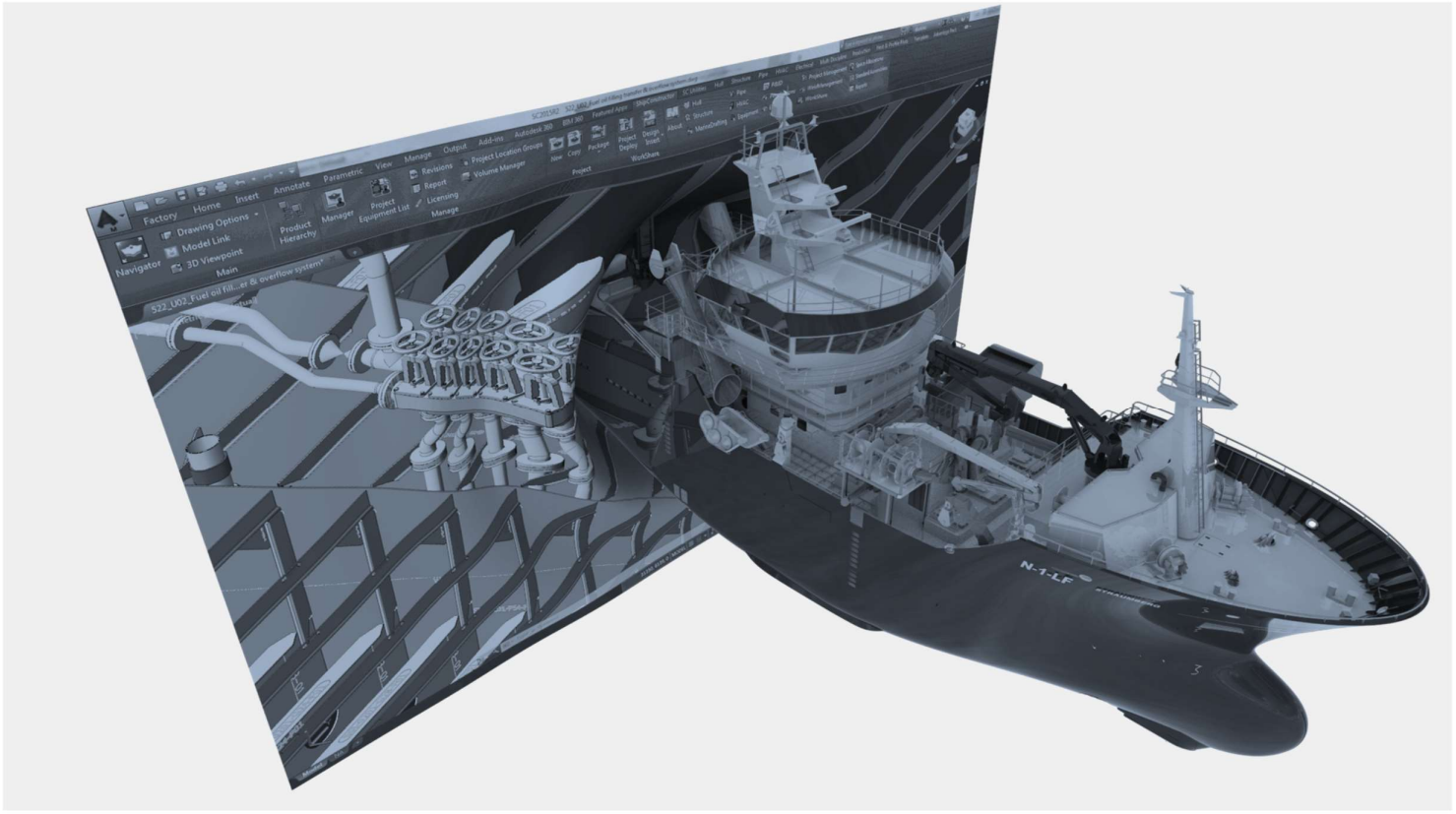
Ship Design Services

Product Engineering



ROMV® | PRODUCT ENGINEERING SERVICES

ROMV CORPORATE MANAGEMENT SYSTEMS S.A.

Guayaquil, Ecuador: https://www.romv-sdci.ec/products/design_serv

Ship Design Philosophy

Constraints

Every ship design must satisfy a purpose and this is usually defined in the Shipowner's Requirements. While the shipowner's requirements are not really constraints they set the boundaries for the design. *"Physical constraints might be applied to the design itself for any one of three reasons: the need to build the ship in a specific shipyard and then get it to sea, the need to maintain the ship during its service life, and the need for the ship to visit specific ports".*

Philosophy

A design philosophy is a weighted list of desired design/ship attributes that is used in the evaluation of design alternatives. Examples of such attributes include:

- First cost,
- Operating cost,
- Manning,
- Producibility,
- Operability,
- Maintainability,
- Reliability,
- Mission capability,
- Sustainability,
- Supportability, and
- Risk (cost, schedule and technical).

Degree of Uniqueness

Contemporary designs cover the gamut in terms of their uniqueness. Some new designs are very similar to existing ships with modest changes, for example, somewhat more or less propulsion power or payload. Other designs reflect significant changes from current practice in specific respects, the propulsion plant type might be an example, but in all other respects they are not unique. At the extreme, and quite rare, is the design that is very different from anything considered before. The rare unique design is not only an exciting challenge for the naval architect but it affects the approach to early stage design as well. This, in turn, might require a major effort to assess the anticipated hydrodynamic loads on the structure. The point designs, once they have been developed, can be used as parents to explore the effects of parametric variations in other, second order parameters. For the unique design, early stage design progress is slower, more difficult, and the design results are much less certain, that is, there is a higher degree of risk in the results of early stage studies of unique designs.

Ship Design Scope of Work

Naval Architecture & Marine Engineering Assignments

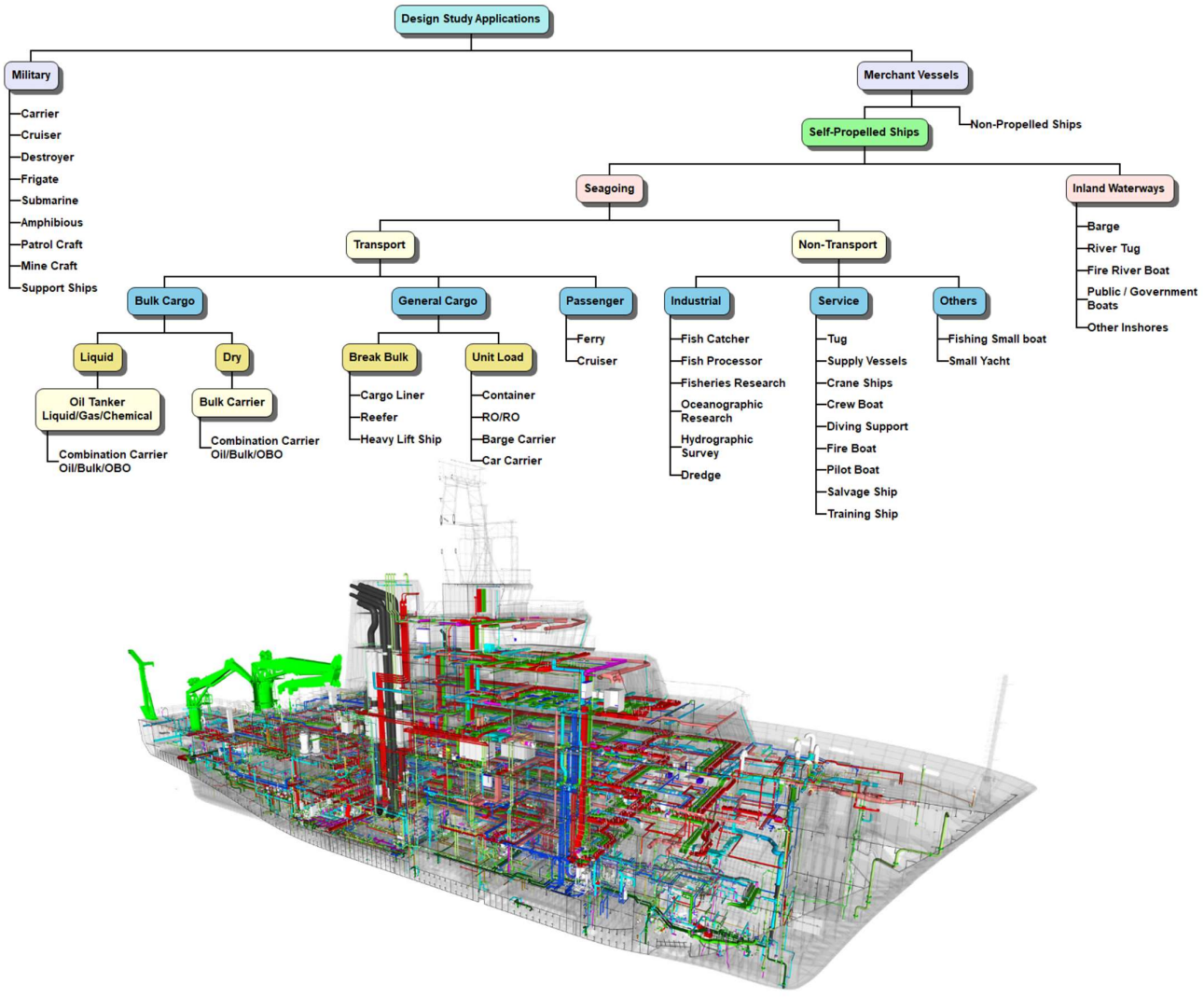
To perform all work on a design project, we consider the following activities as included in our design services:

- Technical analyses including analyses of shipboard systems and structures to determine applicability and optimize use of equipment and space and vibration analyses.
- Calculations in support of submitted designs in the form of reports and sketches will be indexed and stamped by a professional engineer for record keeping and filing with the customer regulation.
- Design of shipboard electrical and mechanical systems and structure including but not limited to the following:
  - Electrical systems including ventilation, steering, air conditioning, vehicle, passenger and crew space lighting and electrical support systems, ships navigation electrical systems including navigation lights, radios, radars, and depth finding systems, electrical systems for habitability systems including galley equipment, and various electrical motors and systems including boat davits, winches and anchoring systems, boat handling equipment, and mooring and anchoring equipment, corrosion control cathodic protection, machinery automation and monitoring and alarm systems, steering controls, propulsion controls, propeller controls, and generator controls.
  - Vessel structure including shell plating, frames, strength members, hull lines, vessel stability, habitability features for passenger and crew spaces, and boats and lifesaving equipment.
  - Mechanical systems including vessel main engines, generators, steering systems, heating, ventilation, air conditioning, firefighting, compressed air, hydraulics, freshwater, sanitation systems, boat handling equipment, and mooring and anchoring equipment.
- Ship checks to ascertain existing conditions in preparation for design development.
- Feasibility studies to determine efficacy and and/or cost benefit of various engineering approaches to solutions of problems or dealing with situations requiring attention, correction, or improvement.
- Drawing and specification preparation in support of Ship Preservation, Improvement, Life Extension, New Construction, and Repair and Maintenance work.
- Cost estimate reports for design work and/or production work for implementation of designs.
- Design support during Ship Preservation, Improvement, Life Extension, New Construction, and Repair and Maintenance work.
- Public involvement: Coordinate, plan, prepare for, and attend coordination, progress, or presentation meetings with the customer and/or other representational officials, groups and/or individuals as may be requested.
- Co-location: Provide on-site technical and non-technical personnel to participate in project design teams led by our managers or other consultant project managers according to custom project methodologies.
- Perform other related assignments as requested by the customer.

Ship Design Study Applications

Categories

For the **scope of work**, we classify all ships based on floating structures Military and Merchant, later non propelled and self-propelled, seagoing and Inland Waterways, finally Transport and Non-Transport. transport and non-transport, with three and four sub-categories, respectively. Our process description applies to all of the sub-categories. We incorporate simplified and effective design exploration models with the ability to quickly generate ship characteristics corresponding to various combinations of payload and speed. Our models estimate the capital and operating costs for each alternative. Optimization techniques may be applied to the major variables to compare alternatives and search for the optimum or graphical output of performance metrics shown for the study option space so that a human decision-making selection can be made at the customer side.



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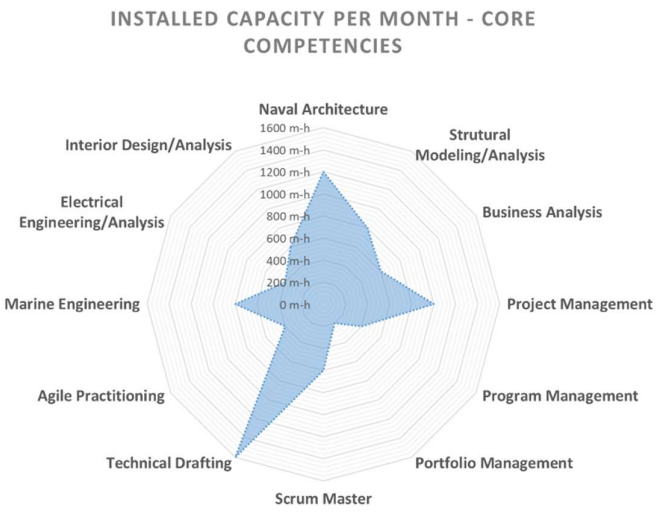
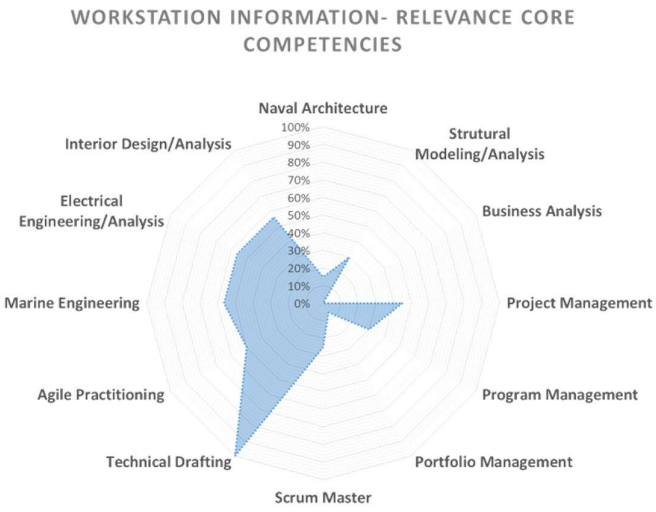
Our Team

Competencies Radar

As a project must be well conceived and adequately financed, our resources are specialists, and experienced consultants, skillfully coordinated and managed to reach **project success** as customer it defines. We know the larger and more complex the project, the more critical this overall management function becomes, for that reason and based on our research, **we have identified twelve core competency** areas strictly considered in our services. These knowledges area have three pillars. **The first pillar** contains general management skills such as leadership, negotiation, communication, team building and other human resource management skills that are necessary in any management position. **The second pillar** contains knowledge of the accepted project management areas including the tools used in ten knowledge areas (such as project scope, time, cost, quality, resources, procurement, communication, risk, stakeholder, and integration management). **The last pillar** contains naval architecture and marine engineering specific management knowledge, such as lifecycle management and product development methodologies. We have an **Installed Capacity** of 8600-man hours each month distributed in two physical offices, Guayaquil and Duran, Ecuador, and we dedicate partial of the capacity for **Transitional and Workstation/Zone Information Preparation accordance to Relevance Core Competencies**:





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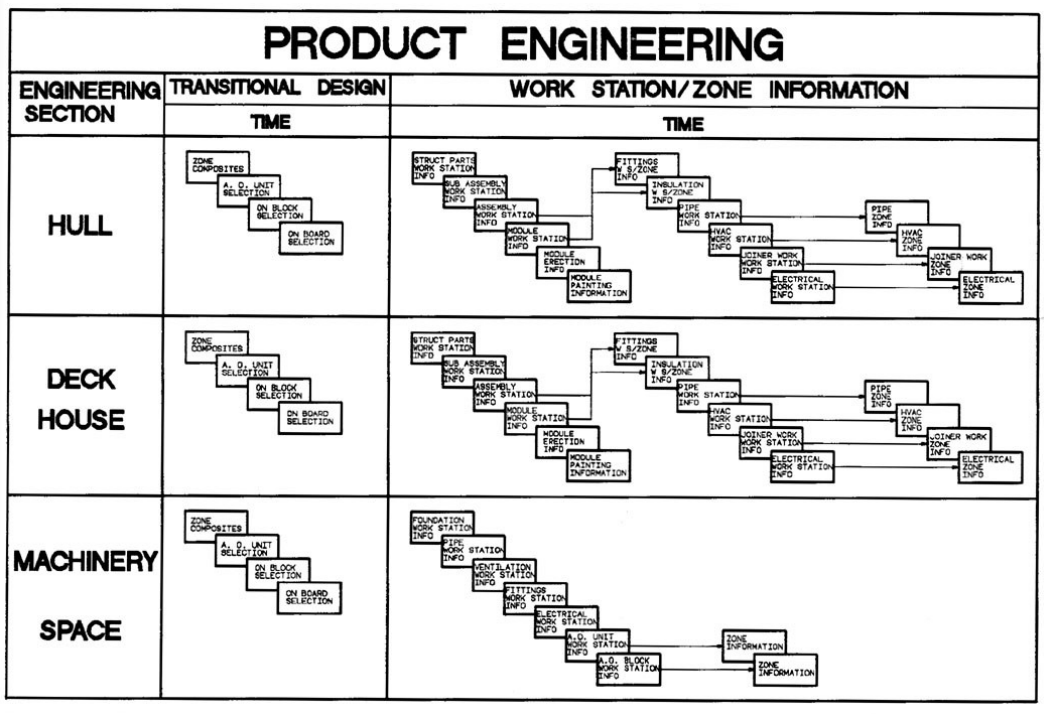
Product Engineering

Transition & Workstation/Zone Modeling

Deliverables

At this stage, we do transitions of all design information from systems to block and zone orientation as complete block and zone design arrangements, and the ordering and assigning of all materials prior to deliver for workshop production. The drawings and product models generated include subdivisions and material ordering zones and we requested to the Shipyard the Shipbuilding Policy and the Contract Build Strategy to define how the ship will be built, and prepare the information based on major machinery items to be loaded, auxiliary machinery and other components to be fitted, what work will be done on-unit, on-block (before and after turnover), and on-board. The breakdown of each zone into sub-zones is also defined and developed into zone information like the structural design work and structural drawings for each block, each with an accompanying bill of material inside all drawings, data and other information required by the production and other service departments to construct the ship. Our management personnel will interact with shipyard planning and production personnel also jointly develop to work sequence sketches. Both define in considerable detail how the ship will be put together. Outfit workstation/zone information is also developed for shops, assemblies, blocks and zones. For the shops, workstation information for both processing and assembly is developed for hull fittings, pipe, sheet metal, foundation structure, joiner, paint, and electrical. Workstation information also is developed for machinery installations on units. The products of a single preliminary design may include the following items:



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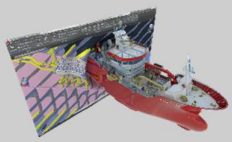
Transition & Workstation/Zone Cost Estimation

About Ship Application

Our cost estimation during **workstation/zone information preparation** activities is at a very high level and makes rather broad assumptions about the ship design, its general mission, and its physical and operational characteristics. We dedicate experienced consultants making broad assumptions about the general methods and organization of the design, engineering, and construction processes, and as a rough order of magnitude we prepared this cost estimation for floating structures applications:

Design Code	Objectives	Time/Cost Estimation
ROMVSDCI_PENG Product Engineering Service 	1. Transition all design information from systems to block and zone orientation as complete block and zone design arrangements, and the ordering and assigning of all materials prior to deliver for workshop production	○ Seagoing Ship • Us$173628 • Us$14.80/man-hour • 22-26 Weeks • 11731 man-hours

Ship Design Services

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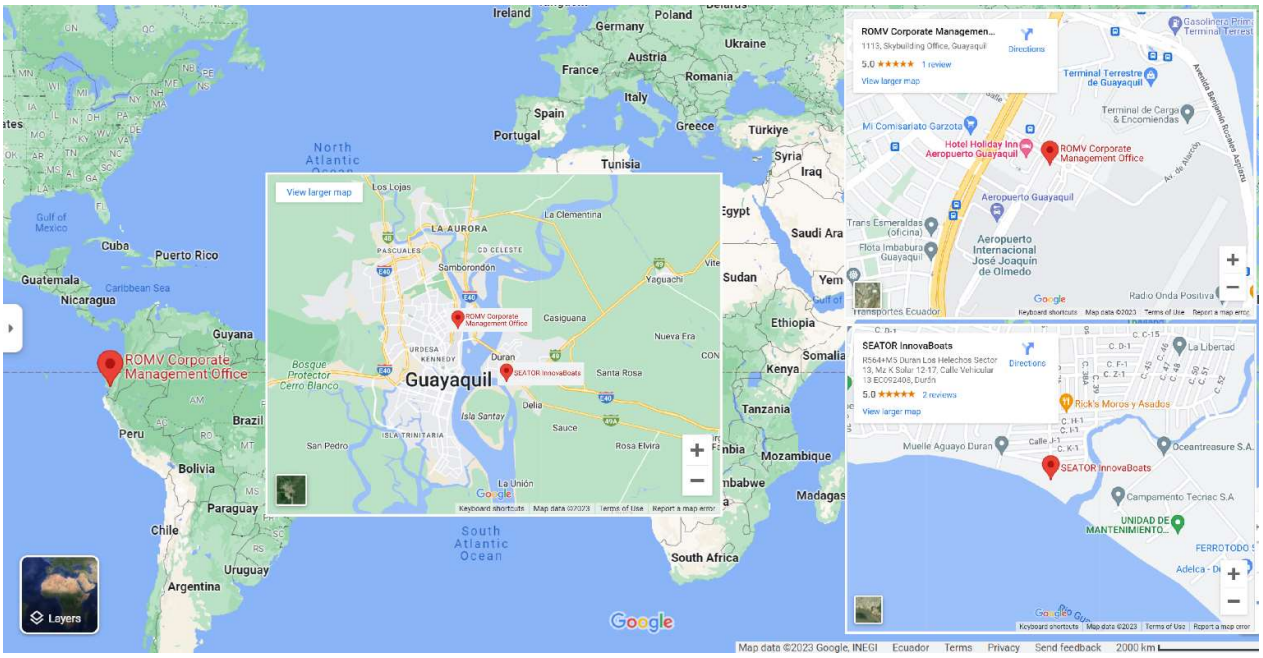
General Guidance & Administration
Hull Structure . Propulsion Plant . Electric Plant
Command & Surveillance . Auxiliary Systems
Outfit & Furnishings . Integration & Engineering
Ship Assembly & Supporting . Loads & Margins



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