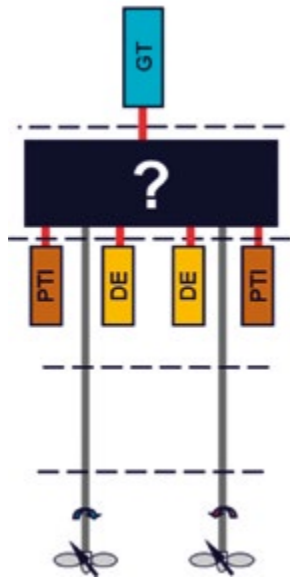


RENK's Project Development – Our strengths

Beyond the boundaries of “gearbox”

Marine gearboxes are an essential part of the propulsion system and, within the drive train, a central link between the main propulsion equipment. Hence, the functional properties of the gear system impact on the performance characteristics of the entire propulsion system. To be able to provide customers with the operational capabilities that exactly match their expectations, these properties must be considered holistically beyond the physical boundaries of the gear system it selves.

The specialists at RENK, have decades of experience and the competence necessary for successful project development as the basis for the design and manufacture of marine gear systems. Trust in what we can do together!



Transparency and Reliability in costs

With reference to previously realized solutions, the ability to precisely define the essential structure of complex products enable RENK to make a reliable assessment of costs to be considered for the shipbuilding budget. The cost assessment usually includes the costs for the through-life support of the product – even during the evaluation of propulsion system configuration options for customer's selection of an optimum solution.

The customer benefits by having a clear idea of the propulsion system's costs right from the start of the project which can then be integrated into the total budget of the shipbuilding project.

Innovation and Project Development – an outstanding combination

If customers want a product that is not yet available on the market in this form, there are basically two options. Either the supplier turns down a new type of requirement as being “not feasible” or alternatively it is recognized as a challenge to develop some new capabilities.

A large number of innovative, also patented solutions have emerged from the projects dealing with specific customer's needs and by addressing new challenges.

The new ideas are sketched out in the project development phase, the proposals are scrutinized for feasibility and, if a decision is made in favor of the product development, forwarded to the Design department.

RENK's Project Engineering – Specialists for customized gear systems

The way it works

From concept to conclusion, RENK's project development cover all aspects, starting from the customer's initial inquiry up to the delivery of the completed draft to the shipyard's engineering department. We define the parameters (including dimensions, weight and main performance characteristics), we carry out analyses, feasibility and comparative studies, we determine the cost parameters and we compare alternative options according to the design criteria worked out with the customer.

RENK's project engineering ensures that the targeted solutions

- are properly configured to achieve the required functions
- can be practically implemented in their entirety
- will function in line with the vessel's required performance profile



RENK's systems advice – How we can support

RENK's professional project development is the foundation for successfully achieving all the project objectives from development, engineering design to propulsion system commissioning.

Together we develop

- a catalog of the relevant propulsion system requirements so that your ship will have the desired capabilities.
- on the basis of your specifications a selection of evaluation criteria for the propulsion system, with these criteria being individually weighted.
- initial proposals for a variety of propulsion system configurations.

Finally we present

The results of our design study along with a fully elaborated recommendation for the configuration of the propulsion system.

We offer to conduct

- Analyses and determination of the main parameters of individual propulsion system configurations. This includes possible operating modes for obtaining the requested operating profile, engine speed and power characteristics for each operating mode, efficiency and fuel consumption figures, weights, dimensions, possible constraints in the arrangement of the drive components, survivability and redundancy as well as physical signatures.
- An evaluation of various propulsion system options using agreed criteria and a determination of the degree to which the respective requirements have been met.
- Thorough vibration analysis of the entire propulsion system.

RENK's system integration – The goals we share and pursue

Once you've decided on a specific propulsion system configuration and the project is being executed RENK is able to assist you in the propulsion system integration.

- We verify that the equipment selected will constitute, as a result of their integration, a complete propulsion system which will fulfil the requirements of propulsion system specification.
- We make sure that the necessary interfaces between the individual propulsion system equipment and the ship have been coordinated.
- We verify that the performance of individual equipment is not affected as a result of system integration and installation onboard the ship and that the functional integrity of the system is maintained.

To ensure that these goals are achieved, the individual engineering tasks are assigned to the ship designer, the integrator, and the suppliers of the main propulsion equipment based on the core competences of the respective party.

In its role of systems integrator RENK will take over the following functions:

- Provide advice in the compilation of the requirement specifications and a corresponding plan of tests and verifications for the propulsion system, including a proposal for acoustic optimization.
- Review of the specifications for the main propulsion equipment.
- Review of drawings, specifications and calculations relevant to the integration of the propulsion system.
- Carry out vibration analysis on the propulsion system.
- Consolidate the interface data, compile and follow up interface specifications.
- Assist the shipyard during the commissioning phase as well as in harbor and sea acceptance trials.





RENK GmbH

Augsburg Plant

Goegginger Str. 73

86159 Augsburg, Germany

Phone: +49 821 5700-0

Fax: +49 821 5700-460

Email: info.augsburg@renk.biz

www.renk-group.com