Propulsion Systems

The choice of potential propulsion solutions is increasing due to the availability of new electrical and propulsor technologies. The different options and the complexities of vessel operations lead to a large number of variables for designers to assess. BMT’s Propulsion team look to current and future technologies for innovative solutions, which enhance the performance and energy efficiency of the ships we assess.

Technology

Ship operators worldwide are beginning to adopt modern ship drive technologies to achieve efficiency gains. The introduction of new and smaller electric propulsion devices has led to an increase in choice of propulsion configurations available to the system designer. Energy savings and recovery devices can be assessed for their suitability with new and existing ship designs.

Operating profile based assessment

BMT Defence Services regularly undertakes power and propulsion assessments for commercial and naval clients. These combine the extensive knowledge of our experts with our in-house propulsion system analysis tool. The assessments encompass a wide range of propulsion configurations, including CODAD, CODAG, hybrids and electric propulsion. They weigh up the benefits of using different propulsors such as propellers, pods, Z-drives and waterjets. They also evaluate the use of different electric motor and converter configurations, using a library of engine, motor and propulsor data.

Through such assessments we take into account equipment operating policies, which may include the minimum number of prime movers and the operation of prime movers to maintain the best economy.

We provide information on the potential exhaust and acoustic emissions of the chosen scheme, and estimates of through-life and unit purchase costs, and the consumption of fuel and oil.

Dynamic based assessment

Dynamic assessments can be performed to allow control strategies to be developed and can include the modelling of ship crash stop and acceleration performance. The outputs plot the variation of system parameters against time: examples include comparisons of the performance of Controllable Pitch Propellers (CPP) and reversible couplings, and the modelling of exhaust plume characteristics. The ability to meet specified crash stop test criteria can also be assessed.

BMT will define the machinery changeovers between operating states and develop the operating philosophy to allow operating procedures to be defined.

BMT use an established electrical system development and analysis package allows system design to be defined to a more detailed level. This permits schedules to be created and costs to be estimated.
Electrical Assessments

BMT undertakes electrical system dynamic analysis to allow ship system specifications for electrical propulsion systems to be defined. Power flow behaviour is determined and short circuit ratings can be identified.

Integrated Logistic Support (ILS)

ILS forms an essential part of the creation of an effective propulsion system. BMT can provide Functional and Reliability Block Diagrams, and vulnerability assessments using the FMECA process. Reliability (Fault Tree Analysis) and availability analysis is also provided as a service.

Through the extensive resource and capability of the BMT Group, complete warship and merchant ship designs can be developed together with the definition of the ILS and support management facilities. As a result, BMT’s experience covers a large number of high profile projects for both naval and commercial customers.