

MARS:News

Military Afloat Reach and Sustainability

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Signed. Sealed. To be delivered on-time...

The Military Afloat Reach and Sustainability (MARS) Tanker contract award event marked the new deal between South Korean company Daewoo Shipbuilding and Marine Engineering (DSME) and the MOD.

Senior staff from DSME, who travelled from South Korea to the MOD DE&S Filton site, joined members of the Royal Fleet Auxiliary and UK ship designer BMT Defence Services to sign the £452million contract in March. Vice Admiral Andrew Mathews, Chief of Materiel (Fleet), signed the contract with Senior Executive Vice President at DSME, Mr Jae Ho Ko.

During the signing Mr Ko handed Vice-Admiral Mathews a crystal paper weight of the MARS Tanker design and joked: "This is an on-time delivery." Vice-Admiral Mathews, said: "This contract marks the end of a long journey and I am absolutely delighted that DSME will deliver the next generation of tankers after winning this competition. We believe these will be excellent ships of which the Royal Navy and the RFA will be hugely proud."

The MARS Tanker programme is managed by the Commercially Supported Shipping team in DE&S, headed by Commodore David Preston. Mr Ko said: "We know that these ships are a high

priority for the Royal Fleet Auxiliary. Likewise, it is true that winning this contract has been like a dream for our company, DSME. "The competition has been challenging and has taken a very long time." He added: "This support vessels contract is so significant that it will be recorded in the history of our company as opening a new chapter."

The tankers will maintain the Royal Navy's ability to refuel at sea and provide fuel to individual warships and seamlessly integrate into Task Groups, and are planned to enter service from 2016, replacing existing Royal Fleet Auxiliary single-hulled tankers.

PDR Passed

The MARS tanker preliminary design review (PDR) has been passed, meaning that the design is deemed to have sufficient maturity to progress into Plan Approval drawing development.

The PDR panel consisted of independent, multi-disciplinary reviewers including David Andrews, Professor of Engineering Design at University College London, whose areas of expertise include preliminary ship design, including personnel modelling, and ship concept modelling.

In order to pass the preliminary design review, the panel assessed several critical areas such as role, interoperability, mobility, habitability, supportability, survivability, adaptability, safety and the supporting documentation.

The review was deemed a success, with a concluding statement that reported no major design failings but identified a few items needed to be prioritised for follow up in the next few weeks. The team was sufficiently confident in the maturity of the design to allow progression into Plan Approval drawings and was impressed with the openness of the responses and summaries presented.

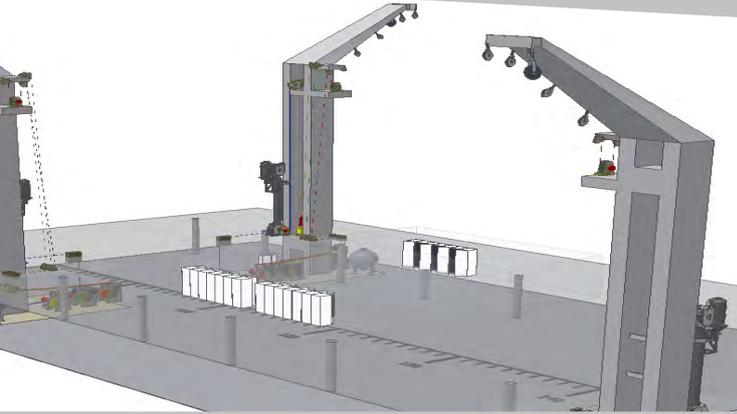
In Brief

Class of their own

The MARS tanker names have been announced:

- Tidespring
- Tiderace
- Tidesurge
- Tideforce

A MARS tanker can pump enough fuel to fill 2 Olympic sized swimming pools in approximately 1 hour



Key Long Lead Item - RAS Rigs

Bosch Rexroth, part of the Bosch Group, has a reputation for delivering abeam and astern replenishment to many navies, including those of Holland, Germany, Belgium, Australia, Greece, Thailand, Turkey, Spain, Pakistan and Indonesia.

Key technical specifications:

- All-electric system with an auxiliary hydraulic drive for the anti-slack devices based on a Commercial-Off-The-Shelf (COTS) design;
- Three abeam RAS stations in total: two on the stbd side, designed to supply the Queen Elizabeth Class aircraft carriers, and a single station on the port side enabling simultaneous abeam replenishment;
- Constant tension of the spanwire is ensured via a ram tensioner with a high pressure air system;
- Two heavy jackstay receiving positions combined with the port and stbd aft RAS stations and a vertrep position utilising the flight deck.

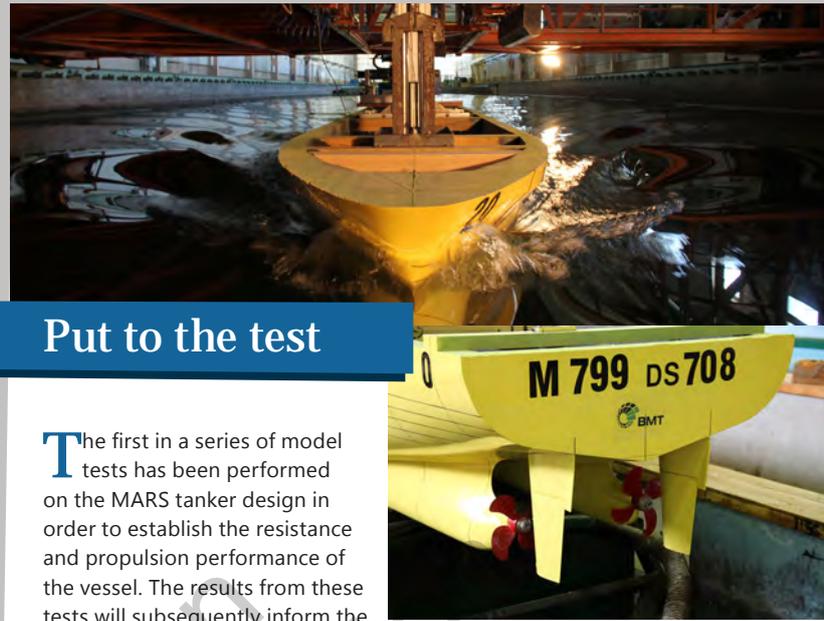
System Advantages:

- Design meets the requirements of Lloyds Register code for lifting appliances in the marine environment;
- Ram tensioner reduces the power consumption in all but the most extreme sea states for RAS operations;

- Below decks installation of the RAS equipment (winches and drives) reduces maintenance costs and increases the space available on the weather deck;

Status Update

DSME and Bosch Rexroth achieved a contract milestone on the 8th of August which has enabled the equipment delivery schedule to remain on track to meet build schedule requirements.



Put to the test

The first in a series of model tests has been performed on the MARS tanker design in order to establish the resistance and propulsion performance of the vessel. The results from these tests will subsequently inform the power specifications needed to propel the ship at the required speed.

Conducted at the Centrum Techniki Okretowej (CTO) Ship Design and Research Centre in Poland with a team of expert hydrodynamicists from BMT, a scale model of the tanker was manufactured, including appendages such as rudders and bilge keels. The model was then towed at specific speeds under a carriage in order to measure the resistance generated after which a propeller was attached and the model was towed again to assess the power

required to push the model at certain speeds. The results were used to specify the engine power required to achieve the speed specified in the contract's technical specification.

The model also underwent resistance tests in a sea-way, allowing the team to gauge the ship's performance in a sea-state against the contract requirements. Further model tests looking to validate these results as well as seakeeping and manoeuvring are planned for October. This should then facilitate the de-risking of the propulsion machinery selection.

Reliability floats

BMT Reliability Consultants are currently focusing on two key MARS project elements: training and integrated logistics support (ILS) requirements.

To ensure that the vessel is fit to join the operational fleet, a Training Needs Analysis (TNA) to compare training requirements with current training provision needs to be conducted in order to identify any new requirements that will enable the crew to operate and maintain the MARS Tanker safely in the most economic way.

For ILS, the Availability, Reliability and Maintainability (ARM) programme ensures that systems and equipment are maintained in optimum condition and effective operational availability can be maximised. A Systems Availability Model (SAM) of the MARS Tanker design modelled against a Leaf Class-based mission profile is being updated to reflect the new design and selected equipment, capturing critical system functions and components necessary to deliver operating roles, mission phases and any functional interdependencies and reversionary modes.