MEDIA TECHNICAL BRIEF

4 July 2014 Rosyth.

Rolls-Royce MT30 – marine gas turbine

Rolls-Royce pioneered the development of gas turbines for marine propulsion, and today, its MT30 is the world's most power-dense on the market. It owes this impressive tag to the Rolls-Royce aero engine from which it is derived – the Boeing 777's Trent 800 power plant, which has the largest combustion core of the company's renowned Trent engine family.

The MT30 (two per ship) will power the Royal Navy's Queen Elizabeth aircraft carriers and selected to power the future Type 26 frigates.

It is already in service with the US Navy on its first two Freedom Class Littoral Combat Ships and will power three of the US Navy's DDG 1000 destroyers. The MT30 was chosen in 2012 by the Republic of Korea Navy to power its FFXII frigates.

Ideal for 'more electric' ships

More of today's naval vessels are becoming 'more electric' designs that rely on such versatile power systems – utilising gas turbines to drive alternators and generators – to perform not only the traditional propulsion duties but also the increasing electrical power loads required for weapon and communication systems and domestic services.

David Kemp, Rolls-Royce, Vice President Naval Sales says: *"This provides the MT30 with a superior power to weight ratio, generating up to 40MW from a 30-tonne packaged unit.*

"As the world's most power-dense marine engine, the MT30 gives navies more power for volume and machinery space than any other marine gas turbine."

The MT30 also provides maximum power at higher operating temperatures and has been tested to US Navy Day rules at 38 degrees Celsius. This offers ship designers much more flexibility in designing the naval vessels of tomorrow and the operator the power required in harsh environments.

Powering Frigates

The Korean (FFXII) and UK Type 26 frigates will be the first use of a single MT30, demonstrating its broad scope for vessels of various sizes and roles, from smaller corvettes and frigates to large aircraft carriers.

In both of these ships, the MT30 will be combined with diesel engines in a hybrid configuration that can switch quickly between cruise and boost conditions for optimum operational flexibility.

Low risk – proven reliability

The MT30 is in technology terms relatively low-risk as it shares 80 per cent commonality with its aero counterpart. The aero Trent family has accumulated more than 45 million flying hours, and now powers the airliners of over 130 customers.

With such in-service experience and its high degree of commonality, the MT30 has a powerful engineering pedigree built-in, providing an excellent foundation for the levels of reliability demanded by modern navies.

The sheer power of the MT30 is proving particularly popular where fast response boost power is required to augment cruise diesels, or for applications demanding a high power-to-weight ratio. In naval vessels, additional power is often required to provide energy for on-board weapons and communications systems.

The MT30 is effective in single and twin-engine configurations. In combination with diesel engines, providing power through electric motors, they are ideal for smaller vessels, such as nimble and swift frigates and corvettes utilised in anti-submarine warfare duties where quietness and stealth are vital attributes. Most of the world's advanced navies have during the past decade adopted flexible configurations based on a single gas turbine with diesels.

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