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RA2

Vehicles & Vessels - Design, Development and Production

Key Characteristics: Energy independent • Replenishment At Sea (RAS) • Nuclear powered tanker • Methanol producing tanker•

Methanol Producing Auxiliary Tanker Concept Ship

A low environmental impact navy is advantageous as it allows governments to operate globally without having to seek exemptions from local and international regulations. The fuel choice is fundamental to the environmental footprint of a navy. Warships are typically expensive with very long design lives, often in excess of 50 years. Navies therefore cannot afford to simply respond to global fuel trends and a staged transition from traditional marine distillate oils via intermediaries such as LNG. Additionally, a navy is required to conduct a spectrum of operations from defence engagement to war-fighting, calling for careful consideration of the type of fuel. Methanol is a proven, clean burning, liquid marine fuel that can be used in gas turbines, internal combustion engines and fuel cells, offering flexibility in warship design.

This project proposes a concept design for a future fuels tanker, which can produce methanol fuel at sea. Employing existing and developing technologies, carbon dioxide is captured from the atmosphere, hydrogen is extracted from sea water, and the two products are then combined over a catalyst reactor to form liquid methanol fuel, which can be stored onboard and later supplied to other warships via replenishment underway. The significant amount of electrical power consumed by this process, along with that consumed by the vessel, is provided by a 600MWt (194MWe) pressurised water reactor. Methanol is synthesised at a maximum rate of 400m³/day. The proposed tanker offers a long-term fueling strategy, low environmental impact and sustained reach, rendering the entire fleet carbon neutral and energy independent.

