Abstract

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State of the Art in the Field of LNGC Dual Fuel Electrical Propulsion System

It is believed that the Liquefied Natural Gas Carrier (LNGC) shipbuilding sector has contributed some portion to the growth of LNG industries by providing competitive and safe transportation means. The motivation of lowering exhaust emissions and the unit transportation cost of LNG for the long distance from production plant has brought substantial changes in the sizes of the LNGC and the propulsion systems. For the last five years, the trend of the propulsion system has moved very quickly from the conventional steam turbine system to higher efficiency dual fuel diesel electric (DFDE) propulsion system. The vessel size has grown from 138,000 m3 up to 263,000m3,the larger cargo capacity together with the higher propulsion efficiency has brought the operation competitiveness for long distance voyage. LNGC have been grown to become an essential component of the world’s available energy resources. Growth in the production and ocean trade of LNGC has averaged about 6.5% a year but has accelerated to about 9% in recent years. Driven by this commercial imperative technology is being developed to allow new classes of LNGC to be designed and built. These designs are pushing technological constraints and fueling innovation. The larger size of the next generation carriers is causing the industry to research and develop many design optimizations including the effects on membrane tank sloshing loads, larger block coefficients, dual-fuel engine technology and propulsion options. After some forty years of steam turbine dominance in LNG shipping, dual-fuel-electric machinery has established itself as a new market standard since 2005. This paper discusses the benefits of burning boil of gases (BOG) and focuses on the latest developments with respect to dual fuel electric propulsion technology.