The influence of incondensible gases on the refrigeration capacity of the reliquefaction plant during ethylene carriage by sea

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Abstract
This paper presents a performance of the reliquefaction cascade plant during ethylene carriage by sea. Parameters of this plant are discussed because of dramatic low cooling rate of the cargo. Ability to decrease ethylene temperature from approx. minus 96°C to minus 103°C on board the ship is essential. Modern ethylene carriers are able to keep cooling rate about 2K per day, on the other hand old ones do it with rate approx. 0.2 K per day and require weeks to achieve proper temperature of ethylene for discharging. Of course, economic issue of such journey is not very satisfying but many factors influence on this. In this paper almost new one â€“ nine months â€“ old ship is considered, with capacity 21 000m³. Main reason of problem is analysed, including heat ingress through the cargo tanks insulation. Gassing-up of the ship is explained and influence of presence incondensible gases in the cargo tanks de…
The carriage of liquefied gases

Introduction

The renewed interest in gas, which started in the 1990s due to its excellent environmental credentials, has seen an increase in the order book for LNG carriers—LNG carriers being the leviathans of the gas carrier fleet. Yet, while attracting great interest, the gas trade still employs relatively few ships in comparison to oil tankers, and hence its inner workings are little known except to a specialist group of companies and mariners. Records show that several ships in this class have been lost at sea because of collision or grounding. Reliquefaction plants are fitted. Because of the simplicity and reliability of stress analysis of the spherical containment designs. Many in the intermediate range (say 30. Fig: Gas carrier on sea passage. Reliquefaction and Boil-off Control. General guidance on safe procedures for relquefacation and boil-off control is given below. The detailed instructions for any ship depend upon the system fitted, and manufacturers’ operating instructions should be closely followed. (14) If the capacity of cargo or refrigerant compressors is controlled manually, plant should be started on the minimum setting and the capacity increased gradually as necessary. (15) Operation of the relquefacation plant will be affected by any incondensable gases in the vapour drawn from the cargo tanks. These incondensables may originate from the cargo itself (e.g., ethane, methane) or may be inert gas remaining from previous purging.

Bibliography

