

热力学

液化天然气冷能回收混合动力循环参数分析

卢涛, 王奎升

北京化工大学机电工程学院

收稿日期 2007-4-3 修回日期 2007-5-29 网络版发布日期 2008-1-14 接受日期

摘要

提出了以氨水为工质的朗肯循环、燃气动力循环和液化天然气循环组成的混合动力循环系统,用于液化天然气冷能回收。建立了混合动力循环中换热和动力设备的能量平衡方程和可用能平衡方程,并以朗肯循环冷凝温度、朗肯循环透平进出口压力、液化天然气循环透平进出口压力为关键参数,分析了上述关键参数对混合动力循环热效率和可用能效率的影响。分析结果表明,混合动力循环热效率和可用能效率随朗肯循环冷凝温度升高、朗肯循环透平进口压力和液化天然气循环透平进口压力增大而提高,随朗肯循环透平出口压力和液化天然气循环透平出口压力增大而降低。

关键词

[液化天然气](#) [冷能](#) [回收](#) [动力循环](#) [参数分析](#)

分类号

Parameter analysis of combined power cycle with liquefied natural gas cold energy recovery

LU Tao, WANG Kuisheng

Abstract

A combined power cycle with LNG cold energy recovery consisting of Rankine cycle using ammonia-water as working fluid, power cycle of combustion gas, and LNG cycle, was presented. The energy balance equations and exergy balance equations of heat exchanger and power equipment in the combined power cycle were established. Taking condensation temperature of Rankine cycle, inlet and outlet pressure of turbine of Rankine cycle, inlet and outlet pressures of turbine of LNG cycle as key parameters, the influences of these parameters on the thermal efficiency and exergy efficiency of the combined power cycle were analyzed. Analytical results showed that the thermal efficiency and exergy efficiency increased with increasing condensation temperature of Rankine cycle, inlet pressure of turbines of Rankine cycle and LNG cycle, and decreased with increasing outlet pressure of turbines of Rankine cycle and LNG cycle.

Key words

[liquefied natural gas \(LNG\)](#) [cold energy](#) [recovery](#) [power cycle](#) [parameter analysis](#)

DOI:

通讯作者 卢涛 lutao@mail.buct.edu.cn

扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF\(418KB\)](#)

▶ [\[HTML全文\]\(0KB\)](#)

▶ [参考文献](#)

服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [复制索引](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

相关信息

▶ [本刊中 包含“](#)

[液化天然气” 的相关文章](#)

▶ [本文作者相关文章](#)

· [卢涛](#)

· [王奎升](#)