

УДК 811.111+662.76

TECHNOLOGIES EXPLOITING THE ENERGY OF LIQUEFIED NATURAL GAS IN THE REGASIFICATION PROCESS

© Uskov I.A., Kuznetsova E.P., Avdeiko S.A.

e-mail: vanyajet@gmail.com; simpson.elizaveta100500@yandex.ru

Samara National Research University, Samara, Russian Federation

Liquefied natural gas (LNG) is a non-toxic, environmentally friendly and very energy-efficient fuel that is more convenient to transport and store than conventional gas. LNG is becoming more and more popular every year as a source of energy for heating networks and as a fuel for power plants and engines.

The article presents an analysis of technological solutions to increase the efficiency of liquefied natural gas use.

The purpose of the work is to show how to make this fuel more economically advantageous with the help of special equipment.

To liquefy gas, it needs to be cooled to a temperature of 162 degrees Celsius, which greatly increases its cost. This is the reason why many companies are abandoning more environmentally friendly and modern fuels in favor of refined products that cause irreparable damage to the environment.

More than half of the world's liquefied natural gas is now being regasified, cooling the atmosphere and thus wasting a lot of energy. The use of low potential liquefied gas energy in the regasification process improves the overall efficiency of this fuel.

After theoretical calculations and analysis of 2 gas-fired power plants, we concluded that thermal cycles use the "cold" energy of LNG increased thermal efficiency by an average of 3-8%. Also, the environmental friendliness of this energy source provides tax benefits for enterprises using liquefied natural gas.

This work aims to show that special equipment can be used to make this fuel more cost-effective, so the development of power plants, allowing the use of energy regasification of LNG, will improve the energy efficiency of this fuel, which in the future will allow not only to cut down feedstock costs but may save the ecology of some regions. Besides, the environmental friendliness of this energy source provides tax benefits for enterprises using liquefied natural gas.

These studies allow us to assert that the solutions we have proposed can be very useful for both consumers and LNG producers.

References

1. X.J. Shi, B. Agnew, D.F. Che, J.M. Gao Performance enhancement of conventional combined cycle power plant by inlet air cooling, inter-cooling and LNG cold energy utilization//App. Thermal Eng., 30 (2010), pp. 2003-2010
2. Qiang W. Yanzhong L. and Jiang W. Analysis of power cycle based on cold energy of liquefied natural gas and low-grade heat source//App. Thermal Engineering 24 539–548.2004
3. T.S. Kim, S.T. Ro Power augmentation of combined cycle power plants using cold energy of liquefied natural gas// Energy, 25 (2000), pp. 841-856