


PROZEMEK

Integrated Chilling Unit

A technology developed by Prozemek Srl for the Petrochemical Complexes

Executive Summary

An overview of our technology of the cooling energy recovery is demonstrated in this case study, this integrated chilling unit (ICU), is particularly suited to be installed in a Petrochemical Complex.

Cooling Energy is responsible for the 37% of the electricity consumption, in an average petrochemical complex; a value that could extend to far more than 70% in a typical food industry processing plant. Consequently, a consistent portion of the atmosphere contamination, in the processing industries is accountable to the cold thermal plants.

Innovative concepts, that will cut operational costs and contemporary reduce ambient emissions, considering the actual low oil price scenario, are furthermore, most than welcome by operators of some industries, that are continuously in needs of efficient ways, to generate cold energy for their production facilities.



At Prozemek Srl, we introduced new concepts to maximize energy optimization, by the recovery of cold energy; we created a technology that applied to a centralized chiller unit, will recover and distribute the cold energy from the LNG processing. Such design is specially suited to the Petrochemical Complex, where depending on the unit's extension, a value equal to 16% up to 37% of the thermal duties, necessary to run the plant can be recovered, thanks also to a featured cold storage system.

The system

The essence of the system is made up a series of exchanges, vaporizers and cold tanks designed to capture and recover the cold thermal energy, which is typically flowing from the LNG plant to the environment or the sea water. The chilled fluid is then distributed to the Petrochemical units by means of the cold piping system, the LNG that provided the cold energy to the chiller fluid, is therefore processed by a desuperheater, before being distributed to the regasification terminal.

A brief process description: cold energy delivered to LNG exchange, is exchanging thermal energy thanks to a battery of ICU exchanges and then distributed to the cold tanks. After being heated, LNG goes to desuperheater and then mixed to the spilled LNG coming from a vaporizer.

Designed to run a typical petrochemical complex, by far more than 30%.

Benefits

Prozemek Srl designed and optimized a system that can be quite beneficial, with a low capital investment, thanks to its efficiency on energy recovery, it can be tailored to any plant configuration, and it will drastically downsize the thermal duties necessary to run a typical petrochemical complex, by far more than 30%.

Tangible results of such achievements are:

- Reduced energy consumption
- Less CO2 Emissions
- NOx and PM sensible abatement.

Limitations

The system is suitable for a complex, which is built close to an LNG Plant, in order to efficiently store and utilize the cold energy. The cold energy is available only during the regasification process, therefore cold storage system, must be designed in the most efficient way to get the maximum advantage.

Some potential risk of contamination of the gas in the LNG exchanger shall be taken into account, thus particular design optimization shall be considered, accordingly to the process data of the fluid processed.

Conclusions

A system to recover the cold energy, has been successfully realized by Prozemek Srl thanks to specially developed exchanges, the system is capable of thermal duty recovery up to 37%, and is suitable for Petrochemical Complex.

Item List

- Pumps for distribution
- Special Exchangers
- LNG exchanger
- Cold Storage Tanks
- LNG Super-heater
- Pipeline for cold distribution

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Prozemek Srl, is a processing plants system technologies company, specialized in design and installation of processing units, all featured by operational excellence and cost efficiency.

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