

## Abstract

### **RESEARCH REGARDING THE REALIZATION OF AN ENERGY RECOVERY SISTEM FROM DETENTION OF NATURAL GAS IN SRM**

The subject of this work is to study, design, construction and testing of a screw expander for power production using the energy of expansion of gas transport systems.

*Chapter 1* presents data on the structure of international trade in natural gas, improving energy efficiency in this field in Europe and especially in Romania, the potential for expansion of natural gas.

*In Chapter 2* is a description of Expander-Generator. Normally pressure reduction is done through pressure regulator valve or rolling the part of the internal gas energy is lost in the process of expansion. If instead the pressure regulator valve or using a rolling turbo-expander (an expansion turbine) coupled with an electric generator, the energy potential of high pressure gas can be used to produce electricity. Energy is useful carrier gas (as an additional source of profit), but it is green, representing an important contribution to the implementation of environmental protection in the context of increasing energy efficiency in Romania imposed following the adoption of international standards in the field, prospect of EU membership.

*Chapter 3* presents the design process to produce electricity. The analysis was done for two situations in the first case was considered gas relaxation, is achieved in one step, and in the second case it was considered that detente is a two-stage gas.

*In Chapter 4* an analysis of the turbine conversion screw compressor - screw expander realizing a new configuration to take advantage helical turbine screw compressors: high efficiency, low maintenance costs due to very good reliability, and not least competitive price.

*Chapter 5* presents the design and implementation of the system. Constructive solution of the system of command and control regulation takes into account the working conditions of all expander-generator, natural gas and zoning work in terms of the danger of explosion.

*Chapter 6* is presented COMOTI stand where the expander has been tested in a configuration determined by the possibility of providing a source of air should drive expander.

*In Chapter 7* there is a technical and economic analysis group expander - generator, where the disadvantages, it is not calling for heating gas installations under the SRM TRANSGAZ sites.

The analysis of literature is the first time in the world when making a screw expander for natural gas.

For screw expander has made an application for patent no. of 2010 00298 of 31.03.2010.

Screw expander won the silver medal at the INVENTICA Salon, held on 6-9 October 2010 in Bucharest, and Skid screw expander containing the gold medal at the Inventor Salon 2011 held in Iasi, on 8-10 June 2011.