Transformation of a cogeneration unit into a trigeneration unit

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Key words: cogeneration production, trigeneration unit, production of steam and electric energy, pressurized air, cooling

The successive increase of energy prices forced a series of enterprises in Slovakia to install cogeneration units in their effort to decrease corresponding costs. However, due to insufficient practical experience in projecting such units used for combined production of heat and electric energy and due to a drop of the production itself, a part of these cogeneration units is overdimensed. This causes, however, a decrease of the effectiveness of their performance in comparison with the designed parameters, the consequence of which is an increase of the recovery period against the planned value.

One possibility how to increase the efficiency of continuous production of electric energy and heat in such an “overdimensed” cogeneration unit is its transformation into a trigeneration unit. A necessary condition, however, is the necessity of a certain steam output in the related enterprise.

The presented contribution is devoted to such a design implemented in a real enterprise in Slovakia. The realization of such a project would not increase the operating costs in comparison with their current values despite the fact that besides the hitherto produced heat with a steam output of 10 – 25 t/h and power plant output of 3.5 MW_{el} also the cooling capacity would be ensured for the technology.