

VOLODYMYR DAHL
EAST UKRAINIAN NATIONAL UNIVERSITY
Department "Logistics management
and traffic safety in transport»

PJSC «UKRZALIZNYTSIA»
Regional branch «Donetsk railway»

MANAGEMENT UKRTRANSBEZPEKA
IN LUHANSKAYA REGION

**GLOBALIZATION OF SCIENTIFIC
AND EDUCATIONAL SPACE.
INNOVATIONS OF TRANSPORT.
PROBLEMS, EXPERIENCE, PROSPECTS**

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INTENSIFICATION OF HEAT EXCHANGE WITH THE HELP OF A FLOW SPIN

Panchuk O., Aleksahin O., Pogoreliy

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It is possible to increase substantially physical data of heat exchange equipment and a power plant itself in general with the help of intensification of heat exchange. The intensification of heat exchange processes is economically reasonable in all the branches of industry.

While developing heat exchange equipment, we use quite a wide range of intensification means, some of them being quite conventional for heat and power engineering: the use of turbulent flow mode of energy carriers; the reduction of channels diameter; the choice of optimal shape of channels cross-section; heat transfer surface ribbing; the application of heat carrier turbulence promoters; the utilization of heat exchange rough surfaces; the spinning of heat exchange flows; the application of short channels and heat exchange noncontinuous surfaces; the utilization of curved channels; the installation of cross baffles in a tube bundle etc.

A great practical effect that could be expected after the application of heat exchange intensification while creating heat exchange equipment has led to an efficient research and substantial introduction of various means of heat exchange in industry.

A heat exchanger flow spin substantially intensifies heat exchange. Centrifugal forces in a spinned flow drive the flow back to the pipe wall, at the same time secondary medium cross flow and the increase of wall flow speed appears which contributes to the heat exchange improvement. The flow spin is provided by a spinned metal band inserted along the full length of the channel and creating constant spin along the pipe, behind which spin intensity gradually damps under the influence of viscous friction in the flow.

The application of a spinned band is efficient in rectangular section under certain hydrodynamic conditions.

A possible disadvantage of flow vortex generators continuously mounted along a pipe is substantial increase in hydraulic resistance. The decrease in hydraulic resistance at quite high level of heat exchange can be reached by means of the installation of a train of separate vortex generators. Heat transfer in such a channel depends on the geometry of vortex generators and the distance between them.

The assembly of separate vortex generators in a pipe is technologically more complicated than the installation of a continuous swirler.

When a working body approaches a pipe input tangentially, heat exchange decreases while moving away from the input (spin damps), however the spin provokes greater intensity of heat exchange than at the initial thermal part of an unspinned flow and on the greater length of the pipe.

The increase of the technical level of heat exchange equipment by means of heat exchange intensification improves general characteristics of a heat and power plant. The decrease of specific fuel consumption greatly depends on the auxiliary equipment of power plants. That is why the intensification of heat exchange serves as a powerful means to increase the efficiency not only of the heat exchange equipment but of a heat and power plant in general.

EVALUATION METHOD TRANSIT POTENTIAL UKRAINIAN TRANSPORT SYSTEM

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Ukraine is located at the intersection of trade and transport flows between world economic centers of Europe and Asia. Experts estimate the share of trade flows between these regions is about 40% of international trade. Therefore, to improve the effectiveness of transit potential of Ukraine are all favorable conditions substantial increase in international cargo transit through its territory. In this regard, the further development of the methodology of analysis and evaluation of transit potential is quite an urgent problem.

The transit potential of the country is determined by the capacity of the transport network, as well as qualitative and quantitative characteristics of the resources of the transport system and its infrastructure to provide transport service for transit cargo and passengers across Ukraine.

The available technological resources of Ukraine's transport infrastructure make it possible each year to transport by rail, inland waterway and road transport and process over ports 120-130 mln tons and pipelines deliver about 200 mln tons of transit cargo. The effectiveness of the use of such an important economic resource does not exceed 40%. One of the main reasons for this situation is the discrepancy technical parameters of Ukrainian transport system infrastructure to modern standards.