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TIMELY SEARCHING OF HEAT CARRIER LEAKS AS A MEASURE FOR INCREASING THE ENERGY EFFICIENCY OF HEATING NETWORKS

The problem of energy efficiency faced enterprises since the beginning of the industrial revolution. Today, despite technical progress, industrial facilities and enterprises do not pay enough attention to all aspects of energy conservation. As a result, the heat network can be insulated, the thermal power plants equipment can be replaced with a new one, but at the same time the pipelines, being in a critical technical condition, cause significant losses due to carrier leaks. Usually the consumption of recharge water in heat networks approaches the maximum boundary values which do not go beyond the standard. However, this approach increases the operating costs annually by millions of hryvnias. A timely heat carrier leaks searching will reduce the consumption of recharge water and fuel for its heating and will increase the energy efficiency of enterprises.

Analysis of foreign sources showed, that developed countries switched to monitoring the technical condition of pipe lines in real time. For example, they use pre-insulated pipes with heat carrier leaks sensors. If a leak occurs in the pipe line, you can remotely determine the location of the heat carrier leak with maximum accuracy and fix it in a short time [1]. In addition, for thermal networks, you can use the thermal imaging method or use a conventional pyrometer.

The less developed countries, including Ukraine, make wide use of more primitive equipment – correlation and acoustic leak detectors. As shown by Russian practice, the use of this equipment increases the accuracy of determining heat carrier leaks [2]. However, the problem of remote monitoring of pipe lines still remains. The use of an acoustic or correlation leak detector is possible only at the site with the departure of the workers. The leak is determined by the increase in consumption of recharge water. After that, by disconnecting the branches of the heat network, a branch with a leak is determined. After determining a specific branch, you can start using a correlation leak detector. This whole process takes a long time and requires the well-coordinated work of a whole team of skilled workers.

In Ukraine, we work according to the same scheme – leaks in a particular section of the pipe line are sought by an acoustic or correlation leak detector. Search for a site with leak age is carried out by measuring the pressure drop over the areas, having previously checked each branch.

The situation is worsened by the technical condition of pipelines. Due to the high accident rate of the sites, the brigade goes to the emergency sites several times a day. In addition, the insulation of the pipe line is broken; in some area it may not be initially. All these factors reduce the energy efficiency of heating networks or other enterprises.

Taking into account the critical technical condition of the pipe lines in the heat networks of Ukraine, first of all, we should pay attention to their placement of the pipe lines to the preinsulate done. Following the experience of developed countries, it is necessary to use pipe line monitoring systems in real time. Investments will pay off quickly, increasing energy efficiency and ensuring trouble-free operation of the system for decades.

Bibliography

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