

SMART GRID SUBSYSTEM OF ACCUMULATION OF HEAT ENERGY

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The goal of the work. Definition on the basis of theoretical and experimental studies on the accumulation of coolant in the generation of traditional and alternative sources of thermal energy, the development of technical solutions for increasing the efficiency of thermal power equipment and reducing thermal and harmful emissions, developing a heat supply method with mobile thermal storages and integrating them into existing heat supply schemes.

The result. In the ITTF NAS of Ukraine from 2017 research and development of the original discrete heating and cooling system using mobile accumulators (MTA) that can be integrated into existing heating networks and radically change the heat supply structure of settlements are being conducted. The advantages of the new MTA are the absence of existing domestic and foreign analogues on the market, the unified design proposed by the project allows us to build on this principle the Smart Grid subsystem. The developed hierarchical structure and multi-level system of heat supply is based on the application of the concept of Smart Grid, computer and information technologies, design and technical documentation sufficient for the introduction into the production of mobile water heating accumulators, which will enable the use of heat from remote consumer sources of heat, namely: helio- and geothermal sources, waste heat boilers working on waste products, household rubbish and local fuels. On the basis of the experimental and calculation data obtained, the design of the prototype MTA with the electronic control unit was developed, its further construction for the field tests was substantiated, and technical measures were formulated regarding a new mode of transportation of thermal energy. The calculations confirmed the possibility of widespread use of mobile thermal storages for operation in conditions of constant operation and in areas of warfare and emergency situations.

Conclusions

1. The use of the subsystem of heat energy and heat transfer with mobile batteries has an innovative novelty and opens up new opportunities for using local fuels.

2. The use of SMART GRID subsystem of thermal energy accumulation has significant advantages, namely increasing the heat utilization factor, reducing harmful emissions, extending the life of the equipment and attractive payback periods of the project.