on overall well-being and productivity; this, in my opinion, should be a higher priority than the value of new technologies.

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POSSIBILITIES OF INCREASE IN ENERGY EFFICIENCY LRE WITH THE HELP OF ADDITIVES

Rocket fuel for liquid engines is usually divided by the number of components. Currently, two-component fuels are undeniably popular. These two separate components (oxidizer, fuel), which are stored in different tanks and fed separately to the combustion chamber, where they are mixed.

Today, the world is developing a new fuel called «acetam» (a 50:50 solution of acetylene in ammonia). The greatest effect from the use of this fuel can be achieved by using it on booster units (BU). Ballistic calculations show that for medium-class LVs, replacing the oxy-kerosene RB engine with an oxy-acetate engine will increase the mass of the payload by 30-40 %. Therefore, the use of acetam, which significantly increases the energy of existing means of removal, gives great savings.

Since oxy-acetamide engines are close to oxy-kerosene engines, it is possible to create modernized aircraft on the basis of existing launch vehicles. They will have the energy capabilities of launch vehicles with oxygen-hydrogen booster units, but at the same time they are easier to operate and much less expensive in terms of launch services, due to the reduction of fuel tanks and therefore the size of the launch vehicle.

Various additives can be added to increase energy efficiency and simplify fuel exploitation. These include:

– stabilizers (etilcentralit $C_{17}H_{20}ON_2$, diphenylamine $C_{12}H_{11}N$) – to increase the chemical stability of fuel during storage;

– phlegmatisers (magnesium oxide) – to reduce explosion hazard;

– energy (dinitrotoluene, nitroguanidine) – to increase energy characteristics;

– dyes;

– rosin – to increase hygroscopicity;

– binders – for SPE, they act as a fuel-binding agent. These are heavy oil products (asphalt, bitumen); modern polymers (polyester, phenolic and epoxy resins); plastics (polyamide, polyvinyl chloride, polyisobutylene, etc.); rubbers (polybutadiene, polysulfide, polyurethane, polyisobutylene, butadiene styrene) and other substances.

Currently, polyisobutylene-based additives to oxygen-gas fuel are actively being developed. The presence of a polymer additive in the LRD fuel component allows to reduce the power consumption of the turbopump turbine due to an increase in efficiency and an improvement in the cavitation characteristics of the pumps of the supply units. Also, their presence reduces the required power of the turbine by reducing pressure losses in the path of regenerative cooling of the engine chamber. At the same time, in engines with afterburning of generator gas, a decrease in the specific power of the turbine is achieved, which increases reliability and provides the possibility of thrust forcing. In engines without afterburning, the consumption of the working medium for the turbine drive is reduced, which improves the design and ballistic parameters of the LV in general.

But the obvious advantages of the properties of fuel with a polymer additive, which allow to reduce water losses in the LRD tracts, on the one hand, and such phenomena that accompany the flow of diluted polymer solutions, such as the reduction of convective heat exchange and the deterioration of liquid atomization in the nozzles, on the other hand, constitute a contradiction and prevent practical the use of additives in rocket and space technology. However, this contradiction can be partially removed. If we take into account the property of a significant weakening of the influence of the dissolved polymer on the characteristics of the turbulent flow in long channels of small cross-section, at high Reynolds numbers and high liquid temperature – the so-called degradation of the polymer solution.

Various physical processes take place in the hydraulic tracts of LPE (centrifugal pumps, regenerative cooling tracts, nozzles, etc.). Among them are turbulent flows in channels of different geometry and flow kinematics, intensive

convective heat exchange, cavitation, spraying processes. The intensity of these processes in the tracts varies within very wide limits. As the fuel component with a polymer additive moves from the engine inlet to the combustion chamber mixing head due to hydrodynamic and thermal effects, specific properties of diluted polymer solutions, including the above-mentioned properties, are degraded, which can negatively affect the operation of the LPE.

Thus, as before, the question of the effect of the polymer additive on the completeness of fuel combustion remains unsolved. Although this research on full-size LRDs does not require the manufacture of a new material part, it is a complex and costly process similar to fire tests of the engine. Therefore, it is expedient and less expensive to conduct a study of the effect of polymer additives to kerosene on the completeness of fuel combustion on a low-thrust nuclear power plant using a displacement fuel supply system.

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USING THE VITE TOOL FOR FAST AND PRODUCTIVE DEVELOPMENT OF WEB APPLICATIONS BASED ON THE REACT LIBRARY

In today's world of rapidly developing information technology, web applications occupy a central place as a key tool for development and interaction in the digital environment. Their development is essential for providing access to information, facilitating effective communication, and creating opportunities for development in various spheres of life. With the spread of libraries and frameworks such as React,