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Increasing the operational and environmental performance of a diesel power installation by utilizing water-based fuel

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ABSTRACT	HOW TO CITE
METRICS	
A new de physicochemic improve the operational performance of agricultura regular oper decreased due	vice for enhancing the cal properties of diesel fuel to combustion process and the and environmental of diesel power plants (DPP) al machinery (AM). During ration, DPP indicators are e to various factors including

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the formation of carbon deposits on the surfaces of parts, causing AM to no longer efficiency and environmental meet standards. The conducted analysis of the AM operation showed that the thermal stress of the parts is increased as a result of forming carbon deposits in the combustion chamber of the DPP. To address this issue. the proposal is to utilize a technical liquid (water) that will be directed to the combustion chamber of the DPP. This process will effectively clean the surface of the carbon deposits and prevent their future formation through the microwave action of the steam-air mixture prepared in the intake manifold. For this purpose, a device has been developed to be installed on board the SHT, integrated into the standard fuel system, allowing the preparation of watered diesel fuel. As a result of complex dynamic processing, a highly dispersed emulsion is prepared from diesel fuel and water, the combustion of which in the combustion chamber of the DSU allows for the complete removal of the formed carbon deposit. The findings show that utilizing the developed device will improve the operational and environmental performance of the DSU, increase the capacity of old equipment by up to 15%, reduce specific fuel consumption by up to 18%, and the soot content in the exhaust gases by up to 14%.

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