

# TECHNOLOGY FOR ENSURING CLEANLINESS OF INNER CAVITIES OF SHIP POWER PLANTS

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Joint stock corporation "Shipbuilding & Shiprepair Technology Center" (JSC "SSTC") is one of the major research institutions in Saint Petersburg, a leading center of shipbuilding technologies in Russian Federation. The Center has status of State Scientific Center of Russian Federation and carries out fundamental and exploratory research in the field of creation of modern technologies for shipbuilding and engineering sectors. It incorporates research laboratories, design and construction divisions, dealing with creation and modernization of shipbuilding yards water-development facilities and engineering enterprises, creation of on-shore bases for marine objects, design and manufacturing of ship fittings, design of fishing and fish-processing vessels, as well as production facilities for manufacturing of designed equipment.

This article reviews methods and tools which ensure high cleanliness rate of ship power plants equipment and pipelines.

Imperative necessity arose to develop non-standard process solutions and special tools in order to provide cleanliness rate required by designers of SPP structure during its assembly and installation. Specialists of JSC SSTC developed VL-type mechanisms (vacuum lifting), which securely remove dry or liquid technological pollutions and capable to lift contaminated liquids up to 20 meters high, thus exceeding capabilities all existing tools.

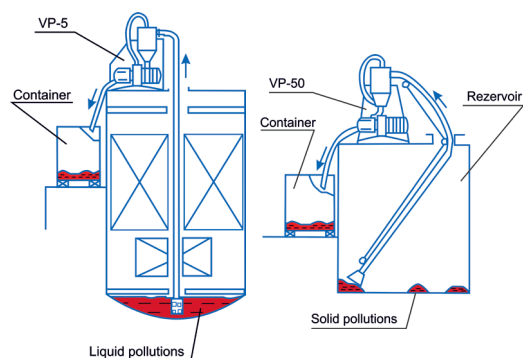


Figure 1

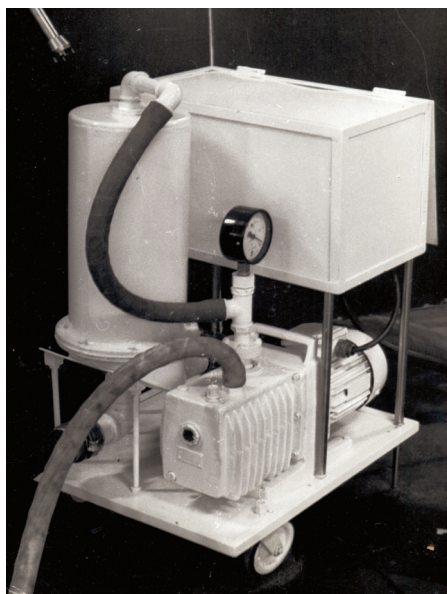


Figure 2

Lifting principle of heavy mechanical particles and liquid is based on creation of local vacuum in decontamination area and subsequent transportation of impurities through suction pipe controlled by local gas distribution unit.

Figure 1 shows 2 cleaning circuits of hard-to-reach areas, which accumulate pollutions. JSC SSTC developed and implemented multipurpose vacuum-ejection machines at various shipyards and other industry branches. For instance, VP-5 machine is designed for removal of technological pollutions from SPP (Fig.2); VP-50 machine is designed for dry cleaning of ship compartments (Fig.3); VP-100 machine is designed for harvesting bottom ooze; UVP-1 machine is designed for removal of highly viscous residuals of vegetable-based fluid. One should consider another very important factor, influencing cleanliness of system inner cavities and equipment. This is pollution caused by protrusion of solid mechanical particles formed by cavitation/erosion process into water duct during operation of flushing stand.

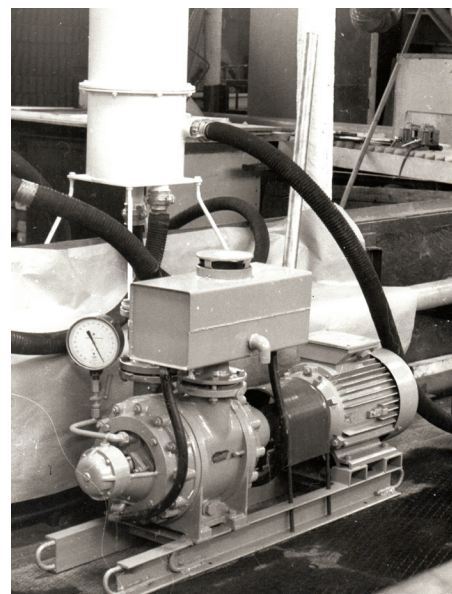


Figure 3

In this case it becomes impossible to achieve required cleanliness rate using standard method. However JSC SSTC developed method and patented the device which uninterruptedly supplies flushing water without use of moving mechanical parts. Cleaning of system cavities is performed by special pumps, providing required pressure of high-quality water in duct by means of gas under rated pressure. Therefore, such hydrodynamic flushing stations lack mechanical movements of separate elements, thus decreasing flushing environment contamination (coming from conventional flushing stands) in about 100 times.

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