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BOOK OF ABSTRACTS

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Concept of "Risk Management" and Optimization of Water Supply in Transport

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INTRODUCTION

The concept "risk management" there is the basis of preventive medicine as it is necessary to manage the factors which raise probability of health infringements, including diseases. The increase of freight turnover and tourist flows is accompanied by increase of morbidity rate among the workers and passengers of transport objects all over the world and is direct consequence of their delayed diagnostics and insufficient registration. The researches which were executed in previous years with our participation included the analysis of ecologic and economic conditions of water supply of some objects of transport in the region, sanitary-and-engineering condition of water supply systems and the used methods' of water processing on the sea ships and in the ports.

The material obtained allow to count that 'the human factor', which actions may provide or not due water supply of transport objects is the major risk factor at an estimation of drinking water quality for the workers and passengers of transport. Components of this factor are (a) owners of objects of transport and services of their supply, (b) experts on the objects of transport and (c) staff of sanitary-and-epidemiologic supervision on transport. The last have the leading role in realization of the concept of "risk management" for the professionally own toolkit for identification and an estimation of risks, development of "line of behavior" and an estimation of efficiency of the undertaken actions. This «the human factor», unfortunately, is also an important obstacle in introduction of new technologies of processing and water disinfection on transport.

The problem of maintenance of epidemic safety and chemical harmlessness of the water used for a long time by the crews during voyages is on the top priority. The factors promoting outbreaks of different diseases on board the sea ships include the polluted reservoirs for storage of the water, its inadequate disinfection, use of sea water for washing and drawbacks in the design of rubber pipes for connection and water tanks. *The aim of the work* presented is to test high efficiency biocide polymer "Aquaton-10" for the processing of water on board the sea ships in natural and experimental conditions. "Aquaton-10" is a serious alternative to oxidizing reagents (widely used in water treatment oxidizing reagents such as chlorine, ozone, hypochlorites, chlorine dioxide e. a.), which lead to education of toxic disinfection by-products, corrosion, and require special measures of safety at plants, storage and transportation. Also, this reagent are high efficiency biocide, low corrosive activity and low environmental impact.

The working hypothesis - «the human factor» is an important obstacle for application of new technologies of processing and water disinfecting on transport.

MATERIAL AND METHODS

The researches have been performed in natural conditions and conditions of the experimental laboratory of our institute. We used microbiological and sanitary-and-chemical analysis of the water long kept on board the sea ships, and the water prepared from the sea.

In experimental conditions the water and walls of tanks for its storage were infected with Escherichia coli O157, P. aeruginosa, and Staphylococcus aureus. The total mutagenic activity of the water (before and after its processing by a solution of "Aquatone-10") have been studied in Aime's test.

We have investigated the efficacy of the named solution for the processing of water, reservoirs for its storage and transportation, rubber pipes for connection, pipelines. Disinfection of tanks has been performed either by "filling" or by "an irrigation of internal surfaces" methods. The solution of biocide in concentration 5.0 – 10.0 mg/l (charge norm is 0.9 – 1.0 L/m^2, exposition – 1 hour) is efficient and sufficient. Disinfection of rubber pipes for connection, pipelines and hoses has been performed by a method of "filling" with the same concentration and exposition.

RESULTS & DISCUSSION

The basic results of the carried out laboratory researches consist in the following: (1) at processing by a solution of the reagent "Aquaton-10" of walls of the modelling tanks, which was infected Escherichia coli O157, P. aeruginosa, and Staphylococcus aureus, water did not contain the above-named microorganisms (investigated in 1 hour after tank filling), (2) results of experiences did not depend on the used method of processing of modelling tanks (3) washouts from an internal surface of hoses through which filled tanks on board the sea ships with tap water, after processing by a solution of the reagent "Aquaton-10" did not contain microorganisms (4) by-products of disinfection in water are not found out (5) Residual concentration of the reagent in water from tanks (modelling, on board the sea ships) was minimum, below admissible (6) After processing of the water with biocides, concentration of aqueous mutagen reduces, whereas the minimal titer of water with toxic effect raises.

CONCLUSIONS

Application in technology of water-treatment of the reagent "Aquaton-10" instead of chlorine, are accompanied by optimisation of organoleptical, sanitary-chemical and epidemiological parameters of the safe of the water. Real possibility of improvement of quality of water on board the sea ships at use of a reagent "Aquaton-10" is not realised because of «the human factor», fear to apply new technologies. That is, «the human factor» should be considered as the greatest brake in realisation of the concept of "risk management" (water safety plan - WHO) in optimisation of maintenance of sea ships (seamen and passengers) of the qualitative water

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