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V.N. Evseev. **On the added liquid mass during the longitudinal vibrations of hull structures.** Pp. 5–11.

The paper gives the solution of the problem concerning the determination of the longitudinal wave propagating speed in the system «hull structure – ambient liquid».

G.V. Udalov. **On the one way to determine the dynamic interaction mass of the elastic fluid vibration-isolating system.** Pp. 12–21.

The article gives a theoretical justification of the possibility to analytically assess the interaction of oscillating bodies through the liquid using the information about the added liquid masses of these bodies. The obtained theoretical relationships can be used to calculate the efficiency of elastic fluid vibration-isolating fixtures, which are an effective means to provide the vibration isolation of the low-frequency dynamic force sources.

V.S. Ivanov. **On the calculation of the circular foundation mechanical impedance.** Pp. 22–64.

The paper gives the solution of the problem concerning the forced vibration of an orthotropic cylindrical cover reinforced with all-round frames. The solution is used to assess the circular foundation mechanical impedance values in the submarine compartment. The solution was obtained using the energy method, the vibration modes being represented in the form of the decomposition by trigonometric functions. It considers the influence of the ambient liquid, hydrostatic pressure at the submarine diving depth and the inherent design losses. The paper gives the expression to determine the power absorbed by the structure. It also gives an example of the mechanical impedance calculation for a typical circular foundation and absorbed power. The paper shows the governing role of the system's natural frequencies and their relationships with the exciting force frequency.

The paper also gives a simplified solution of the problem for the case when it is required to assess the circular foundation mechanical resistance only normally towards the cover.

A rather detailed description of the solution is aimed to draw the interest of the specialists, especially young ones, to the analytical methods of solving the problems, including the application of the orthotropic cylindrical shell theory.

V.Yu. Kirpichnikov, D.V. Lyapunov, V.V. Savenko. **Noise emission reduction of the ship structures using anti-vibrators.** Pp. 65–76.

The paper contains the results of experimental investigation on the noise emission reduction of the ship structures using the simplest passive anti-vibrators.

V.P. Ilyin, Yu.S. Yakovleva. **Analytical assessment of the propeller edge noise spectral levels.** Pp. 77–83.

The paper examines the parameter calculation method for the submarine propeller edge noise, based on the statistic data processing of the full-scale propeller noise measurement. According to the full scale measurement data, a more precise relationship between the edge noise spectral levels and the propeller rpm has been found.

V.Yu. Kirpichnikov, V.V. Savenko, Ye.V. Yakovleva. **Analytical determination of the ship structure vibration levels caused by the equipment acoustic field.** Pp. 85–94.

The paper describes the developed methods (energy and equivalent forces methods) for the approximate calculation of the vibration level in the area of bearing (mounting) structure under the installed machinery based on the known noise levels in the air layer between the machinery and the structure. The calculation results are compared to the laboratory experiment data.

M.N. Kuzmichev. **The influence of the air-containing layer on the acoustic wave passage through the plane-parallel system of layers.** Pp. 95–107.

Using the method of associate impedances it became possible to carry out the assessment of the noise-suppression efficiency and noise isolation of the plane-parallel structure consisting of the liquid-like, solid and air-containing layers, the structure being excited by the «force source» or air noise.

M.E. Badaeva, M.Ya. Pekelny, V.V. Savenko. **Reducing the levels of resonant sound emission caused by hull vibrations induced by forces due to propulsor operation.** Pp. 108–120.

Running vibration of the hull caused by the forces induced by the propulsor and the infra and low frequency sound emission induced by this vibration have a bad effect on the ship's habitability. The paper analyses the possibility of suppressing this vibration and sound emission of the hull at lower resonant frequencies of its elastic vibrations through the vibration absorption of separate structures inside the hull. The paper shows that the proper arrangement of these structures along the hull, as well as that of the masses and natural frequencies of their connections with the hull, makes it possible to substantially reduce the running vibration and infrasound radiation.

V.Yu. Kirpichnikov, A.P. Koshcheev. **Experimental research on the influence of the resonance phenomena inside the circular cylindrical shell on its vibration excitation and sound emission.** Pp. 121–133.

The paper gives the results of the experimental investigations regarding vibration and acoustic fields of a circular cylindrical shell considering various ways of its excitation. It is shown that in a wide frequency range the resonances in the excited spacing can have the governing influence on the levels of these fields.

A.B. Maizel. **The influence of hull and superstructure on the ship air noise radiation caused by the machinery operation.** Pp. 134–151.

The paper investigates the hull and superstructure influence on the ship's air noise radiation caused by the noise emission from the gas exhaust holes of the main and auxiliary engines, air intake and discharge devices, ventilation and air conditioning systems, engine room skylights. The paper examines a model problem of the acoustic field of a point monopole located near the equator and the pole of an absolutely solid oblong ellipsoid of revolution. It is shown that the presence of such body near the sound source can substantially reduce its own far field, the areas of both sound amplification and attenuation being possible to observe.

I.V. Grushetsky, A.A. Grishin. **Measuring of ship structure inherent loss coefficients and using these in the calculations.** Pp. 152–171.

The paper gives the measurement results of the inherent loss coefficients (ILC) for various hull and inside-the-hull structures of Project 20380 (corvette). It has been found that the lLCs of the structures have a great spread due to a largly accidental nature. Based on the measurement data, it was possible to assess the statistic characteristics of ILC as random value. The paper gives a calculation example (using energy method) of the vibration spreading along the ship section. In the course of the calculation a probabilistic approach has been applied where the ILCs obtained from statistic characteristics are used as initial data. Calculation results illustrate the probable spread of expected vibration in the range of 7–10 dB for those ship structures which are far from the vibration source. It confirms the applicability of probabilistic approach and approximate methods for the calculation of acoustic vibration and noise.

V.Yu. Kirpichnikov, V.V. Savenko, D.V. Lyapunov. **Some ways and means of acoustic improvement of ship foundations.** Pp. 172–197.

The paper gives the investigation results concerning the improvement of the ship foundations' vibration characteristic through the achievement of the maximum possible values of their mechanical impedance in relation to the dynamic efforts acting from the machinery, and through the increase of vibration energy loss in the foundations.

V.S. Ivanov, V.V. Petrova. **Physical aspects of sound radiation by periodically inhomogeneous plate.** Pp. 198–235.

The physical aspects of the known V.N. Evseev solution for the problem of sound-radiation by an infinite plate with periodical inhomogeneous features are analyzed. The frequency functions of intensive sound radiation by such structures are found, radiation mode shapes are determined, the effects of acoustic environment properties and structural losses are estimated, the directional patterns specific to sound radiation of inhomogeneous plate are investigated.

Yu.F. Shlemov. **Development of rules for acoustic control of ships and shipboard equipment with allowance for measurement errors.** Pp. 236–247.

The method for validation of the acoustic control algorithm for ships and shipboard equipment is suggested which is using the mathematical tools of statistic quality control theory with allowance for measurement errors. It is shown that the algorithm has to be developed with allowance for measurement errors as well as the need for assessment of the customer and supplier risks in the acoustic control process. Options for practical implementation of the suggested algorithm are suggested.