

**SIGNATURE CONTROL FOR NAVAL SHIPS,
COMMERCIAL VESSELS & OCEAN
ENGINEERING STRUCTURES**

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- ✓ Obtaining experimental values for coefficient of energy transfer through the hull structures of marine installations;
- ✓ Theoretical justification of a necessity to identify oscillation energy radiated by marine structures to the environment.

The developed methodology will ensure further enhancement of methods to improve vibroacoustic characteristics of various structures.

DEVELOPMENT OF THE "BRAMS" SOFTWARE PACKAGE FOR DESIGN AND COMPUTATION OF MARINE EQUIPMENT VIBRATION INSULATING SYSTEMS

One- and multi-stage shock mounts with extended linear and volumetric bearing structures of high elasticity are widely used in modern shipbuilding and other branches of

industry. Available software tools based on solid state modeling used for computations of oscillating systems are not accurate in defining the motion parameters of shock-mounted structures. Developing a new generation software package has required:

- ▶ Analysis of inertia and rigidity characteristics of shock-mounted marine equipment, and external factors affecting equipment under ship operating conditions;
- ▶ Plotting of design model for shock mounted equipment considering the bearing structure final rigidity;
- ▶ Development of methods to resolve the tasks and algorithms for BRAMS software package.

The performed research work has resulted in development of BRAMS software package enabling to identify:

- ✓ Equipment displacement;
- ✓ Free vibration mode and frequency;

- ✓ Deformation of shock mounts, flexible joints in pipelines and shafting considering final rigidity of bearing structures.

BRAMS software package offering highly confident evaluation of parameters for vibration isolation systems of marine equipment will have:

- ▶ A user-friendly graphical interface in OS Windows 95, 98, NT, XP and 2000;
- ▶ An option for visual monitoring of assigned input data;
- ▶ Standard finite elements similar to those being used in DACS software package.

DEVELOPMENT OF SOFTWARE TOOLS FOR COMPUTER MODELING OF ABOVE-WATER SIGNATURES

Today, when designing the ships, vessels, offshore platforms and other engineering structures it is required to take into account the top deck structure geometry and its effect on:

- ▶ electrical characteristics of transmitting and receiving antennae;

- ▶ electromagnetic compatibility of electronic equipment located on the top deck;
- ▶ electromagnetic radiation levels harmful for people

The software developed by the Krylov Institute enables to:

- ✓ assess the high-frequency electromagnetic field level both in short- and long range;
- ✓ calculate the input impedance and antenna directional pattern in the actual ship environment.

The software package implements the custom-made modification of moment model and incorporates well developed pre- and post-processor tools of 3-D modeling. Geometrical pre-processor ensures plotting of surfaces and structures of arbitrary shape and topology, and specifies excitation sources and concentrated loads for antenna. The mesh for triangle and core type boundary elements on the plotted surface is generated automatically. The post-processor is used for plotting of antenna directional patterns, as well as for express analysis of electromagnetic situation based on visualization of electric current surface distribution, normal and tangential constituents of electric and magnetic fields.

