ABSTRACTS OF D.SC. AND PH.D. THESES

Selected abstracts of D.Sc. and Ph.D. theses submitted at Russian transport universities

Dinh Viet Thanh. The mutual influence of two parallel tunnels constructed by the shield method in the conditions of Vietnam. Abstract of Ph.D. (Eng) thesis. Moscow, MADI, 2018, 24 p.

The expediency of the shield method when sinking two parallel tunnels in Hanoi and Ho Chi Minh city is investigated, mathematical spatial models of construction of objects in soft soils corresponding to local conditions have been developed. It is shown taking into account the identified dependencies and factors that the nature of the plot of the maximum sediment of the earth's surface and stresses in the lining of tunnels can be approximated by a hyperbolic function with a high degree of confidence. Measures to limit the sediment and damage of the surface of the soil, buildings and structures during conducting works with shield method are established.

Dontsov, S. A. Improving labor safety through improving the system for preventing hazards in railway transport. Abstract of D.Sc. (Eng) thesis. Moscow, RUT, 2018, 48 p.

The scientific novelty of the thesis is to develop effective tools, approaches and methods to ensure occupational safety and health, control and prevention of hazards on railways, to justify the transition from the principle of domination of insurance claims to the occupational risk management system, where the role of awareness of violations or threats prevails. On the basis of the conducted research, the use of an integrated indicator of working conditions to assess its safety, as well as ways to improve the personnel safety system at the enterprises of the industry have been proposed.

Gainanov, D. N. Mathematical apparatus and software of computer complexes for solving problems of analysis of inconsistent systems with massively parallel data processing. Abstract of D.Sc. (Physics and Mathematics) thesis. Moscow, MAI, 2018, 40 p.

Methods for creating application software based on the analysis of inconsistent systems and models of massively parallel data processing, methods of mathematical modeling of inconsistent systems from the standpoint of graphs and combinatorial optimization (graphs of independence systems), combinatorial geometry (properties of families of diagonals and faces of convex polyhedrons), and the theory of Boolean functions (maximum upper zeros of monotone Boolean Function are proposed. The properties of graphs of independence systems for various classes are comprehensively considered. Along with others, a theorem on the existence of a fuzzy-length cycle in the graph of maximal joint subsystems was proved, the concept of alternative coverage was introduced, the concept of a G-diagonal convex polyhedron was introduced, as well as a new natural optimality criterion for decoding monotone Boolean functions. A mathematical model has been developed for managing transport processes under conditions of inconsistency at the example of rail cargo transportation.

Knyazev, A. S. Aviation wind powered complex with improved weight and dimensions indicators for an emergency power supply system of an aircraft. Abstract of Ph.D. (Eng) thesis. Moscow, MAI, 2018, 20 p.

The design of the prospective aviation wind powered complex (AWPC) with a magnetic system of a cone-shaped electric generator, the design methodology and the mass-dimensional optimization of AWPC are developed by the author. The method of designing a generator with permanent magnets contains fundamental formulas, including equivalent transformation of electric machines, and determination of a critical angle of inclination of an air gap to an axis of rotation of a rotor. The optimization method includes ways to improve the mass and size parameters of the complex and the generator.

Matesheva, A. V. Methods for analyzing, forecasting and reducing the socio-economic consequences of occupational morbidity rate due to air pollution by transport infrastructure objects. Abstract of D.Sc. (Eng) thesis. Moscow, RUT, 2018, 48 p.

A method for targeted compensation of financial losses to employees in environmentally unfriendly territories when getting diseases caused by air pollution through the use of a hedging mechanism (a special approach to financial risk management) is presented. A method has been developed for predicting air pollution and the associated health risk based on the theory of sensitivity, which allows assessing the situation with lead times from several months to several decades, taking into account the likely climate changes. A numerical model has been built, experimental calculations have been carried out, and predictive estimates have been obtained for the city of Moscow regarding the hazard of emissions from transport infrastructure facilities. Determination of the place and power of emissions will be facilitated by the method of analysis (identification) of sources of air pollution based on minimization of special functionality, built in solving the problem of the evolution of pollutants.

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