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Information for Authors and Readers

УДК 629.78.007

Main Results of the ISS-34/35 Expedition Training and Activity When Carrying out the Mission Plan. O.V. Kotov, S.N. Ryazansky

Abstract. The paper considers results of the ISS-37/38 expedition's activity aboard «Soyuz TMA-10M» transport spacecraft and the ISS. Also, it presents a comparative analysis and estimation of the crew's contribution to the general ISS flight program. Particular attention is paid to implementation of scientific applied research and experiments aboard the station. Remarks and suggestions to improve the ISS Russian Segment are also given.

Keywords: tasks of crew training, spaceflight, International Space Station, scientific applied research and experiments.

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Express Analysis of Medical Support of the ISS-37/38 Crew Members. V.V. Bogomolov, V.I. Pochuev, I.V. Alferova

Abstract. The paper presents the results of medical maintenance of the ISS-37/38 expedition members. It also gives a brief description of operation of the system of medical support and maintaining the stability of human environment aboard the ISS RS. Besides, the paper sums up results of the implementation of medical recommendations, the program of medical monitoring and the use of onboard means designed to prevent the alteration of cosmonauts' health status in spaceflight.

Keywords: medical support, medical monitoring, preventive system, human environment, work-rest schedule.

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The Strategies of Maintenance and Repair Operations Performed by Crews of Manned Spacecraft in Orbit. B.I. Kryuchkov, V.A. Dovzhenko

Abstract. The paper deals with the problems of performing maintenance and repair (M&R) of advanced space complexes and long-term space vehicles in orbit. It considers the possible ways of performing M&R of manned and unmanned space vehicles and suggests the strategies of M&R using the ground-based and orbital service stations. Also, the paper suggests arrangements for ensuring safety of M&R operations realized in the course of the development and usage of the advanced spacecraft.

Keywords: a space vehicle, maintenance and repair, a service station, system of M&R operations, risk factors, crew safety.

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Space-time Model of the State of a Manned Orbital Complex. A.A. Kuritsyn, V.I. Yaropolov

Abstract. The paper presents a space-time model (STM) of the state of a manned orbital complex (MOC) created using the discrete mathematical apparatus, set theory, and probability theory. A generalized model of the MOC, the set states of MOC, state transition probability matrices are also considered here.

Keywords manned orbital complexes, simulators, the International Space Station, a space-time model, transition probability matrix.

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A Space Scooter. Yu.A. Baurov, F. Meneguzzo

Abstract. The paper presents the results of physical experiments on substantiating the creation of a scooter for cosmonauts to move in space and proposes the new physical principle of the movement of objects in physical space, based on the new non-gauge natural force and on the use of physical space (dark matter) as a supporting medium. Also, it presents the structural framework of a scooter and the reasons for conducting an experiment on the board of the International Space Station.

Keywords: a space scooter, outer space, physical space (dark matter), space experiment.

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Ways of Improving the Adequacy of Modeling Visual Conditions of the Earth Surface Monitoring on the Service Module Simulator of the ISS RS. A.I. Mitin, V.I. Bragin

Abstract. The paper considers practical ways of tackling issues of modeling visual conditions of the Earth surface monitoring on the Service Module simulator of the ISS Russian Segment. It shows the basic problems and ways of upgrading the external visual environment simulation system (VESS) of the SM simulator. Also, the paper presents the construction principles of the channel of imitation of observational tools to train cosmonauts for visual-instrumental observations of the Earth's surface on the basis of virtual reality technologies.

Keywords: visual-instrumental observations, technical facilities for cosmonaut training, external visual environment simulation system, computer-based image generation, development of the VESS for the SM simulator of the ISS RS, imitation of observational tools, virtual reality technologies.

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On the Shape of Boundaries and the Size of the Coverage Area of the Planets' Surfaces from Space Vehicles. M.N. Burdayev

Abstract. The paper analyzes the size and boundary shape of Earth's surface observed from space vehicles for the different deviation angles of the optical axis of an observational tool from the sub-satellite point and for the different angles of its conical field of view.

Keywords: Earth's surface, a satellite, a coverage area, area boundaries.

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Sociocultural Parameters of Cosmonaut Professional Community. L.V. Ivanova

Abstract. The paper analyzes the main sociocultural parameters of the cosmonaut professional community and presents the impact of main sociocultural characteristics on the formation of the image of a cosmonaut and on the development of the corporate culture of the community, which are interrelated and interdependent. Also, the paper considers the relationship between the Russian Orthodox Church and cosmonauts in modern Russia.

Keywords: sociocultural parameters, corporate culture, subculture, image, religion, traditions, society, rising generation.

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Space Robotic Systems on the International Space Station. M.V. Kondratenko, K.A. Titov, A.M. Salaev

Abstract. The paper presents an overview of manipulators used on the International Space Station and considers the controls of the ISS's manipulators and the European Robotic Arm (ERA) which should be installed on the Russian Segment as well as some problems of cosmonaut training for the ERA.

Keywords: International Space Station, a manipulator, installation, activity, control.

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Training of the First Crew of Almaz Manned Orbital Station (to the 40-Year Anniversary of Flight of the Salyut-3 Space Station). Memoirs of M.L. Shugaev, a crew instructor

Abstract. The engineering-historical essay presents the stages of preparation of the first crew of Almaz military manned orbital station and briefly describes the content and designation of the onboard systems. Also, it gives a historical background of the organizational structure of the 1-st Department of the CTC in 1971–1974 and a detailed description of the specific contribution of various experts in the training of the Almaz OMS crews.

Keywords: Almaz OMS, crew training, Irtysh simulator, a space flight, onboard systems, flight data file, observation of ground objects, photographing, film-processing, a return capsule with film.

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