China has officially recognized the Russian GOST of digital twin products

National Standard of the Russian Federation GOST R 57700.37-2021 «Computer models and modeling. DIGITAL MODELS AND SIMULATION. General Provisions» is officially included in the list of mutually recognized standards in the field of aircraft construction between China and Russia. The standard was developed by specialists of the technological development ecosystem of Peter the Great St. Petersburg Polytechnic University (NTI Center of SPbPU «New Production Technologies») together with specialists of the Russian Federal State Unitary Enterprise «Russian Federal Nuclear Center — All-Russian Research Institute of Experimental Physics» (FSUE RFNC-VNIIEF).

For the first time in the world practice, the GOST establishes unified definitions of the terms «digital product model», «digital twin of the product», «digital (virtual) tests», «digital (virtual) test bench», «digital (virtual) test site», as well as «multi-level requirements system», «model adequacy», «product model validation», «computer modeling software verification», «computer modeling software validation», «computer modeling software certification».

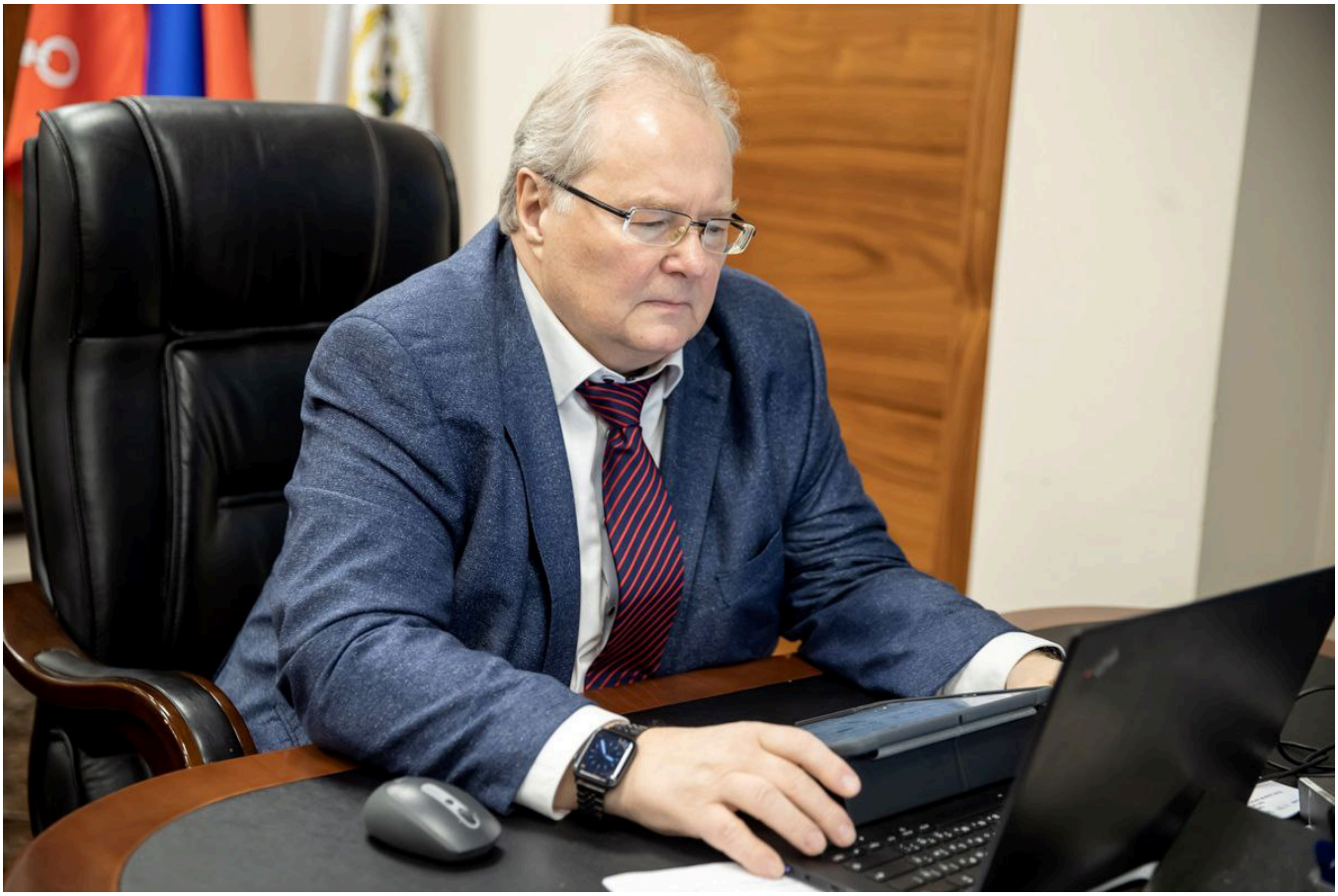
Since January 1, 2022, the standard is valid in the territory of Russia. GOST

R 57700.37-2021, now translated into Chinese, since November 24, 2023 is included in the list of mutually recognized Russian and Chinese standards in the field of aircraft construction. This list includes standardization documents in the field of computer modeling, model verification and validation, digital testing, digital twins of products, as well as computer-aided design, interoperability, and life cycle management systems.

The official ceremony of signing the approved list took place on November 24 in Beijing at the 14th meeting of the special working group on standardization of the Russian-Chinese Sub-Commission on Cooperation in the Field of Civil Aviation and Civil Aircraft Engineering. The special working group is co-chaired by Anton Shalaev, Head of Rosstandart, and Guo Chenguang, Head of the Standards Innovation Management Department of the State Administration for Market Regulation of the People’s Republic of China.

The Russian-Chinese Special Group on Standardization (SG) was established by a joint decision of the Ministry of Industry and Trade of the Russian Federation and the Ministry of Industry and Information Technology of the People’s Republic of China in 2015 to develop standardization issues and support joint Russian-Chinese projects in the civil aircraft industry. To date, the WG has six Task Forces (TFs), including the Task Force (TF5) «SMART standards», whose work is aimed at sharing experience, organizing technical meetings and workshops on such topics as SMART standards technologies, digital twins, computer modeling, etc., as well as preparing a «Russian-Chinese White Paper on SMART standards for civil aviation».

On November 20, 2023, a joint Russian-Chinese «Workshop on Digital Standards in Civil Aviation Sector» was held, one of the key topics of which was the practice of standardization work in the field of digital twins of products in Russia and the PRC. Alexey Borovkov, Vice Rector for Digital Transformation of SPbPU, Head of the Advanced Digital Engineering School of SPbPU, was invited to the Workshop with a 40-minute report «Practice of Digital Twins and its standardization work in the aviation industry in Russia» as the head of the working group «Digital Twins» of TC 700 «Mathematical Modeling and High Performance Computing Technologies» and the head of the group of developers of the national standard GOST R 57700.37-2021 «Computer Models and Modeling. DIGITAL MODELING AND SIMULATION. General Provisions».



The report was devoted to the practice of application of the technology of development of digital twins of products in the aircraft industry. Borovkov reminded that GOST R 57700.37-2021 establishes the definition and general provisions for the creation and application of digital twins of products in industry. This advanced technology is able to make a key contribution to the development of competitive products of high-tech industry in the shortest possible time.

Digital twin is an advanced technology created at the intersection of the material and digital worlds, which becomes a driver of sustainable economic development of high-tech companies within the fourth industrial revolution, explained Alexey Borovkov. GOST R 57700.37-2021 concerns the most important stage of the life cycle — the development stage, where all the key competitive advantages of the future product are laid down. Implementation of digital twin development technology at the development stage allows to improve the quality of product design, to ensure the fulfillment of technical and tactical-technical requirements, to increase the effectiveness of the conducted tests of prototypes, reducing their number to the necessary minimum. The digital twin is supplemented and enriched (‘becomes smarter’) at each stage of the product life cycle.

At the Workshop Alexey Borovkov presented the rich experience of interaction between SPbPU Advanced Engineering School and SPbPU NTI Center and enterprises of high-tech industries in terms of joint research and development. The speaker specified that the application of digital twin development technology in accordance with GOST R 57700.37-2021 is actively used in the engine industry, in the automotive industry, in nuclear and oil and gas engineering; the speaker separately mentioned the aviation industry and cited a number of completed projects as an example.

Concluding his speech, Alexey Borovkov emphasized that the projects implemented by SPbPU NSP in the field of system digital engineering using the technology of development of digital twins of products on the basis of GOST R 57700.37-2021 are aimed at solving the problems corresponding to the world level of relevance and importance in the priority areas of technological development of Russia. Establishing definitions in a normative document allows companies to use a unified terminology when forming technical specifications and conducting R&D, accelerating the introduction of the latest technology into industry.

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