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25 YEARS OF WELDING IN OPEN SPACE

Prof. **B.E. PATON**

On July 25, 1984 Svetlana Savitskaya and Vladimir Dzhanibekov, USSR pilot-cosmonauts, conducted world's first experiments on welding, cutting, brazing and coating in open space. Successful performance of unique experiments in space environment demonstrated the possibility of effective activity of cosmonauts when performing complex operations on welding and related technologies on board the manned orbital complex in open space, and is indicative of a high perfection of welding hardware, created during many years of intensive work of a large team of scientists and engineers of the E.O. Paton Electric Welding Institute in close cooperation with Yu.A. Gagarin Cosmonaut Training Center. Sergej Pavlovich Korolyov, founder of practical cosmonautics, outstanding designer of Soviet space systems, already at the start of 1960s foresaw the need to perform in space the operations, involving welding, and provided all kinds of support for research on welding and cutting in space. In 1964 S.P. Korolyov set the task of development of a program of welding experiments in space and plan of joint work of OKB-1 (now Rocket-Space Corporation «Energiya») and the E.O. Paton Electric Welding Institute of AS of the Ukr. SSR. Thus, the Institute started fulfilling a research program, the final aim of which was development of equipment and technologies for joining materials in space by welding. On October 16, 1969 during the flight of «Soyuz-6» spaceship pilot-cosmonauts G. Shonin and V. Kubasov performed welding and cutting of metals



Savitskaya Svetlana Evgenievna — *Russian pilot-cosmonaut, two times Hero of the Soviet Union*

Born on August 8, 1948 in Moscow, graduated from the Moscow Aviation Institute and Central Flight-Engineering School of DOSAAF of the USSR. In 1980 joined the cosmonaut unit. S.E. Savitskaya made her first space flight in 1982. On July 25, 1984 she took the world's first space walk, staying for 3 h 45 min outside the spaceship. During the time she together with V.A. Dzhanibekov performed experiments on welding and related technologies. In 1986 she defended the thesis of Candidate of Sciences. Up to 1989 S.E. Savitskaya worked as Deputy Department Head of SPA «Energiya». In 1992–1995 she was Assistant Professor of the Moscow State Aviation Institute. Starting from 1995 she has been the Deputy of RF State Duma.



Dzhanibekov Vladimir Aleksandrovich — *Russian pilot-cosmonaut, two times Hero of the Soviet Union*

Born on May 13, 1942, in Iskandar settlement, Taskent district, Uzbekistan. In 1965 graduated from Eisk Higher Aviation School of Pilots and served as pilot-instructor in the USSR Air Force. Starting from 1970 he has been member of the cosmonaut unit. Performed 5 space flights, including international missions, as spaceship commander. Performed his first space flight in 1981. In 1984 during the fourth flight conducted an experiment on welding in open space together with flight-engineer S.E. Savitskaya. From 1985 up to 1988 he was the cosmonaut unit leader, and from 1988 — Head of Theoretical and Research Training Department of Yu.A. Gagarin Cosmonaut Training Center. In 1997 he was transferred into the reserve.

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