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REMOTE MONITORING OF ENVIRONMENTAL CONDITIONS AROUND NUCLEAR POWER STATIONS FROM SPACE VEHICLES

Abstract

Most probably, it would be difficult to find an alternative to further development of nuclear energy under present conditions of increased society's power consumption. Nuclear energetic should become the main source of energy of the twenty first century. Due to various reasons like presence of oil and gas available in sufficiency in the world market at acceptable prices, accidents at the nuclear power plants caused public distrust, absence of reliable concepts for nuclear and radioactive safety it did not rise to the head during the twentieth century. At the same time, in case of normal work the nuclear power stations practically do not emit to the atmosphere any products causing significant radioactive contamination.

The serious exclusions represent the accidents at the nuclear objects; it is needed to emphasise the thermal explosion of a reservoir with highly toxic wastes in the "Mayak" enterprise, Southern Ural region, close to the town Kyshtym in September 1957; accident in Windscale, UK, in October 1957; accident in the power station on the Three-Mile Island, USA, 1979; accident in Chernobyl power station in April 1986; and also the last accident in the Fukushima-I station in Japan in March 2011.

With growth of nuclear power stations' proportion in total production of electric energy, development of the new effective techniques for remote detection and control over radioactive contamination of environment becomes ever more challenging. Therefore, development of supranational systems for control over spreading of radioactive contaminations becomes one of priority tasks of space monitoring in XXI century.

The preliminary investigations carried out since beginning of the nineties at the scientific enterprises of the Russian Academy of Sciences, Universities and at Roskosmos have shown that radioactive contaminations at the earth surface and in the lower atmosphere may be successfully registered by traditional means of space monitoring. These modern techniques are based on registration of environmental response to radioactive contamination.

The practical value of the works carried out is in the fact that the obtained results may be used for creation of regional and global systems of supranational control over radioactive contamination and prevention of radioactive contamination within the areas potentially hazardous from technogenetic point.