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**Rosatom’s Scientists Developed Prototypes of Irridum-192-based Micro Sources for *Brachytherapy***

*The newly developed product will replace foreign analogues and make available cancer treatment with the “Brachium” gamma-therapy system*

Experts from Reactor Materials Institute (IRM), a company within Rosatom's Scientific Division, have developed ionizing radiation sources based on iridium-192 for use in brachytherapy. The high-dose therapy using these sources is safe for patients and practitioners, while being effective in treating numerous malignant tumors, both intracavitary and interstitial.

The uniqueness of Rosatom scientists’ solution is the small size of the device. It consists of a needle irradiated in the IRM’s research reactor and enclosed in a capsule. The capsule has a cable manufactured using specialized techniques and welded onto it. All these operations are performed remotely using a manipulator in a high-temperature chamber.

“We have already developed prototypes. Now we are ready to deliver them to clinics for testing. We plan to get our product certified and registered as a medical device in 2025. Once we have all the necessary permits in place, we will launch the product in the Russian market and later the CIS market,” said Denis Butakov, Head of the Radiation Technologies at IRM JSC.

Brachytherapy allows precise point treatment due to introduction of small applicators that deliver doses of ionizing radiation directly into or very close to the tumor. This makes it possible to target cancer cells with high-dose radiation while minimizing damage to the patient’s body.

The manufacturing of iridium-192-based sources, which is set to commence in 2025, will ensure their availability for clinics that utilize Russian gamma-therapy systems and facilitate the replacement of foreign equivalents that Russia now imports.

**For reference:**

Reactor Materials Institute, Joint-Stock Company, was established in 1966 in Zarechny, Sverdlovsk Oblast. It is a leading nuclear materials research facility in the Urals region, conducting reactor testing and post-reactor research for the nuclear industry in accordance with the most recent standards. The Institute boasts a robust production infrastructure, which includes an IVV-2M research reactor for the generation of isotopic materials and research purposes. Additionally, it features hot cells, radiochemical equipment, and a site for the manufacturing of irradiation devices.

Research and Development Institute for Technical Physics and Automation, Joint-Stock Company, (NIITFA JSC) a part of Rosatom’s Scientific Division, develops and produces high-tech products for nuclear medicine, radiation technology and engineering, radionuclide energy, non-destructive testing, and superconducting materials and equipment. The Institute's modern research and manufacturing capabilities enable the scientists to combine their scientific expertise with the development and manufacturing of innovative products of high quality and relevance recognized not only in Russia, but also abroad. For more than 30 years, NIITFA JSC has been supplying its products to dozens of countries while continuously expanding its global presence.

Reactor Materials Institute has been involved in the development of ionizing radiation sources based on iridium-192 and selenium-75 for industrial non-destructive testing for more than two decades. Radiography is used in gas, oil, shipbuilding, nuclear, and metallurgy industries for non-destructive testing. The Institute has been successfully supplying these products to the domestic and international markets. The scientists have used their expertise to develop products that help treat oncological diseases and save tens of thousands of lives.

The gamma-therapy system “Brachium” is designed for radiotherapy departments, specialized cancer treatment centers, prevention and medical research facilities. The system uses closed-source gamma radiation based on cobalt-60 or iridium-192 radionuclides. The source type depends on the customer's needs. The manufacturing of these devices is an important social project aimed at improving the quality of cancer treatment.

The Russian government and relevant agencies are making efforts to enhance domestic healthcare capabilities and ensure full national independence in this area. As a state partner in improving life expectancy and quality, Rosatom is increasing the production of a wide range of medical equipment and radiopharmaceuticals, creating an absolutely independent healthcare system capable of providing the Russian population with diagnostic and treatment services for serious illnesses.