
6.3. INNOVATION (INNOVATION CAPITAL)

6.3.1. INNOVATIVE ACTIVITIES

“ After the events at the Fukushima Nuclear Power Plant many countries tightened their reliability requirements and the total number of orders for construction of nuclear power plants in the world has dropped. In Russia, on the contrary, this number has increased. This upholds the global recognition of the Russian technology and experience of Russian companies ”

Sergei Kirienko,
Chief Executive Officer of Rosatom
State Corporation

The Innovative Activities Program (hereinafter referred to as IAP) of OJSC Atomenergomash has been designed to ensure implementation of the Division's strategy and objectives.

The purpose of developing the Program is to ensure high competitiveness and economic efficiency of the Division's enterprises through:

- development and implementation of innovative high-tech mass power engineering products and maintenance of such products at all stages of their life cycle on domestic and foreign markets;
- development and optimal utilization of innovative processes (process stages) used in production in power engineering and other activities of the enterprises;
- participation in the development and manufacture of pilot and experimental equipment to support research programs of State Research Center of the Russian Federation and replication of the results of scientific research to the products and respective manufacturing technologies.

¹ Hereinafter, means the position number in the Risk Map.

The program sets priorities in addressing the objectives of OJSC Atomenergomash in development and utilization of the innovations as well as in optimizing utilization of the resources allocated. The additional objectives of the OJSC Atomenergomash IAP are:

- to reduce (optimize) the product cost while maintaining reasonable safety criteria;
- to increase labor productivity;
- to save energy and material resources;
- to improve consumer qualities (to meet customer's requirements) of products;
- to increase environmental friendliness of production and comply with the customer's environmental requirements.

The program provides for implementation of a range of R&D works, which will be the basis for technology audit, assessment of competitiveness of the technologies used both at enterprises of OJSC Atomenergomash and at competing enterprises as well as for development of specific measures to improve the competitiveness factors. The technology audit data will allow the Company not only to fine-tune the goals setting system, to form a clear vision of the Company's own abilities and options for using the existing opportunities, but also to realistically assess the focuses and costs of improvement to its own technological base and development of innovative products and services.

The technology audit is planned to be conducted in 2014.

The Innovative Activities Program of the Division approved by the CEO of OJSC Atomenergomash was reviewed by the Innovation Committee and was preapproved as per the Resolution of the Rosatom State Corporation Innovation Committee dated 02/05/2014.

The function of managing the innovation activity of the Company is assigned to the Director of the Engineering Department, Yu.P. Arkhipov. To ensure effective implementation of management processes, an Engineering Processes Group was created.

To ensure efficiency of innovation management, the personnel was assigned KPIs, such as "Number of contracts signed with universities for R&D in the reporting period", "Planned increase in the number of copyrightable intellectual property items, including know-how and applications for registration in the national and international patent authorities", "Increasing the number of intellectual property items used, including license agreements", "Relative increase in revenue from sales of innovative products developed in the last 5 years", "Implementation of the approved Innovative Activities Program".

6.3.2. R&D RESULTS

List of innovations implemented in the production process

During 2013, 25 intellectual property items copyrighted as know-how (including license agreements) were introduced in the business. These innovations (technological, structural, process, basic and welding materials) are used for a wide range of equipment produced.

The share of such products in the revenue of 2013 amounted to 62%.

During 2013, the subsidiary, affiliate and supervised organizations of the Company filed 71 applications for state registration of copyrightable intellectual property. The total number of patents received in 2013 amounted to 74.



1 TECHNOLOGY AUDIT

2 REGULATORY FRAMEWORK



3 NUMBER OF PATENTS RECEIVED BY SASC

AEM
3.2.1

AEM
3.2.2

AEM
3.2.5



MAIN MEASURES TO IMPLEMENT THE INNOVATION ACTIVITIES STRATEGY:

No.	Enterprise	Action
1	OJSC OKB Hidro-press	<p>Development and implementation of a standard project of optimized and computerized power unit with VVER technology</p> <p>Expansion of nuclear power capacity range based on commercialized technologies</p> <p>Increasing the installed capacity utilization factor (ICUF)</p> <p>Modernization of the experimental facilities of SASC</p> <p>Technology and management system computerization projects</p> <p>Creating new technologies for energy markets</p> <p>Development of a new technology platform for nuclear power industry based on a closed nuclear fuel cycle using the VVER technology</p> <p>Expansion of nuclear power capacity range based on new technologies</p> <p>Creating an experimental base for verification of design codes</p>
2	OJSC SverdNII-Khim mash	<p>“Standard Water Treatment Plant” project</p> <p>“Standard Special Building” project</p> <p>“Equipment and services related to fabrication of MOX fuel” project</p> <p>“Technology for closing the NFC” project</p> <p>“BREAKTHROUGH key technology” project</p>
3	OJSC SNIIP	<p>“Development of a competitive domestic RUMCS” project</p> <p>“Specialized testing ground for comprehensive inspection and metrological support of RUMCS and instrumentation” project</p> <p>“Development of a new generation automated radiation monitoring system” project</p>
4	OJSC TsKBM	<p>Project for “Creation of a high-tech optimized MCPU for the AES-2006 and VVER-TOI projects”</p>
5	OJSC NPO TsNIIT-MASh, CJSC AEM Technologies, OJSC Energomashs-petsstal, OJSC PZM	<p>Development of metallurgical technologies</p> <p>“Development of Detailed Design (Industrial Standard) for forging ingots for nuclear engineering” project</p> <p>“Development of a manufacturing technology and commercialization of production of castings for main circulation pump (MCP) shells of 06Kh12N3DL steel” project</p> <p>“Creation of a modern complex for production of electroslag melt billets for MCP pipeline, shell equipment for 2nd circuit of NPPs and other critical equipment” project</p> <p>“Commercialization of technology for production of castings for VVER-TOI reactor shell with three welds” project</p> <p>“Development of production of large ingots made using the siphon method” project</p> <p>“Research and development of a technology for manufacturing TUK basket elements of composite Al-B, Al-Si-B (Alboron) system alloys to accommodate fuel elements” project</p> <p>“Analysis of the growth kinetics of hot cracks in the brittleness temperature range during manufacture of main power equipment” project</p> <p>“Development of the state standard “Fastening threaded connections for nuclear power plants. Tolerances. Clearance fit” project</p> <p>“Development of a process regulation for manufacture of heat exchange tube fittings of critical heat exchangers for nuclear power engineering” project</p> <p>“Establishment of modern production of racks for storage of fuel assemblies (FA) using steel with high boron content” project</p> <p>“Establishment of high-tech production of stamp-welded gate and wedge gate valves for nuclear, thermal power, oil and gas industry enterprises using nanostructured protective coating” project</p> <p>“Creation of resource-saving production of environmentally friendly transport packages (TUK) for storage and transportation of spent nuclear fuel” project</p> <p>“Creation of high-tech production of control valves for thermal power industry enterprises using nanostructured wear-resistant coating” project</p> <p>“Commercialization of a technology for production of domestic clad pipes” project</p> <p>“Analysis and certification of materials and technology of electroslag facing using single layer uniform anticorrosive coating on the inner surface of ECCS accumulator shells and the inner surface of the pressure compensator shells” project</p> <p>“Creation of high-tech production of ball cocks for oil and gas industry and thermal power industry enterprises” project</p>

“ The Engineering Division is a storehouse of knowledge and intellectual property. We protect the interests of all enterprises of the Division both in Russia and abroad. It is important to preserve and develop the scientific potential, to present it on the international arena as a competitive one ”

Dmitry Sitishko,
Chief Legal Advisor, Legal Department
of OJSC Atomenergomash

6.3.3. R&D EXPENDITURES

According to the IAP funding plan of Rosatom State Corporation, 906,850 million rubles were allocated for the Division's projects in 2013¹. Implementation of the IAP envisaged development of the technological base at SASC.

The 906,850 mln rubles were spent as follows:

- modernization of production at OJSC AEM Technologies: 469,710 mln rubles (IAP project of Rosatom State Corporation No.21);

- experimental design work using in-house resources at OJSC ZIOMAR EC to build an SHS — 15,000 mln rubles (IAP project of Rosatom State Corporation No.22);
- experimental design work using in-house resources at OJSC Afrikantov OKBM for maintenance of RITM-200 – 144,850 mln rubles (IAP project of Rosatom State Corporation No.53).

Total cost of R&D performed as per the program for the orders from the industry or external customers in 2013 amounted to 277.29 mln rubles.

The total cost of R&D performed by universities in 2013 amounted to 67 mln rubles. The share of funding for contracted work by universities to perform R&D under the IPA is 15.33%, which is 7.39% of total investment inclusive of modernization.

R&D expenditures from the aggregate revenue from the sale of products (net of the value added tax, excise duties and similar mandatory payments) in 2013 amounted to 1.43%. By 2020, the Company's objective is to spend 4.48% of the annual revenue on R&D projects.



6.3.4. DESCRIPTION OF KEY STRATEGIC RISKS AND OPPORTUNITIES

№ ² Risk	Risk factors	Control measures/ opportunities
6 Lack of competitiveness of the current products and technologies	Loss of technological advantage Stricter requirements to parameters of the power equipment	Active development of new product and technology solutions (RUMCS, new types of forgings, etc.) Expansion of RPS implementation

¹ The work done by OJSC OKB Hidropress, OJSC TsNIITMASH, OJSC SverdNIIKhim mash, and OJSC TskBM under the IAP projects of Rosatom State Corporation were not included because the responsibility for implementation of these projects was assigned to other divisions of Rosatom.

² Hereinafter, means the position number in the Risk Map.

R&D EXPENDITURES BY KEY SASC, MLN RUBLES.