

## **Alena Fomina, Electronics Central Research Institute: we assist everyone who is motivated to obtain results**

*How does the Innovative Radioelectronics contest shape the culture of entrepreneurship in the field of high technologies, and what opportunities for engineers and scientists are created by contest?*

In spring 2018 the Innovative radio electronics contest for young scientists and engineers is held again. Its purpose is not only to identify the most promising scientific and engineering developments of young people, but also to prepare their developments from the stage of "idea" to the implementation in practice. How does the project help to stop the outflow of Russian professionals abroad and what opportunities are opened for professionals in the field of radio electronics — these issues have been highlighted in the interview with 4science by Alena Fomina, the General Director of the Information and Analytical Centre of the Russian Radio Electronics Industry Electronics Central Research Institute.

**- This year the Electronics Central Research Institute jointly with the Ministry of Industry and Trade holds the contest of scientific and engineering developments under the title of "Innovative Radioelectronics" for the fifth time. What is specific for this season contest?**

— We have approached the fifth anniversary season. Of course, we wish to make it stand out and strong — both in terms of the composition of the participants and the program of activities. Our entire project is aimed at creating and developing a culture of technological entrepreneurship in Russia. We work with developments progressing to different stages. We assist those people, who are at the stage of an idea or a technical solution, we help them to develop themselves, to obtain the required knowledge in terms of "packaging" of their start-ups, we prepare a first business plan, calculate a financial model, assess project risks. There are people, however, who organized their small innovative business themselves, but they have difficulties in finding customers, in organizing a stable production, marketing and sales, and, as a result, difficulties in scaling. We launch for them our accelerating program, which is to include several best projects of the Innovative Radioelectronics contest.

**— How does the destiny of the past years' winners develop? Whether new employees or new enterprises came as a result from selection process?**

— Winners of the previous years are both very young but very talented students' projects, and commercially successful small innovative businesses, and also serious fundamental developments of young researchers. All of them, are nevertheless distinguished by the great motivation, by the great desire to learn, to develop themselves, and most importantly - to make the world a little better, to create something really useful. Some of them continued their work on the projects and achieved success — received interesting propositions for cooperation, financial and expert support. Others are successfully developing their careers. There are people, who proceeding from the results of their participation in the contest, retargeted their projects and realized that they need to move in a different direction. Such step is not always final but is no less significant.

**— You accept projects for participation in contest at different stages of implementation. And what sort of applications will be rejected for sure?**

— It was not at once, when we succeeded in arranging the selection system correctly. Initially young researchers came to us with projects, which were developed by the whole research group, and the contribution of the young team of professionals was not

always visible. But we are interested in commercially-targeted projects having a demand in the market rather than in academic research works. The training level of the teams for the recent five years has also changed — currently many people come to participate in the contest with already developed products, which merely need to be commercialized, rather than with theoretical developments only.

**— Can you give some interesting examples of developments participating in the contest?**

— I can recall a portable gas analyser, which was developed by young researchers and capable to diagnose some particular types of diseases on the basis of findings of patient's breathing tests. Today the prototypes have already been manufactured and they are currently being tested jointly with I.M. Sechenov First Moscow State Medical University. Among other projects of the contest I can recall also trackers for virtual reality and environmental monitoring systems mounted on small unmanned aerial vehicles. In the previous year an interesting project was presented — that was a domestic CAD (computer-aided design system) for microwave integrated circuits. Currently all developers are forced to use foreign software, while the cost of the licenses is simply running over the top. This, in its turn, affects the final value of Russian developments. After the final stage the authors of the project were invited to visit Skolkovo and they probably may soon become new residents of Skolkovo.

**— Well, and how many similar success stories can you tell about the contest winners?**

— We somehow help anyone, who is motivated to achieve a result. Like I said, someone receives interesting career propositions from representatives of the industry organizations, who are elected the members of the contest jury every year. We help some people in finding a partner in the industry, because, for example, microelectronics is a too big sector wherein it is impossible to develop a product without partners, and we present a project and the team competences to say Micron or Angstrom. Another option is a completely commercial type of project for which we conduct market survey and jointly with the team we build a strategy for successful promotion thereof, we help to search for potential customers.

But it can be just an innovative idea. For example, all developers of such products are focused on measurements of blood pressure and the number of steps, while nobody is concerned about emotions. The project of the contest finalist, who developed a bracelet for transmission of emotions at a distance and actively progressing for today: the project has become a resident of Skolkovo, participated in SLUSH (Helsinki, December 2016) international start-up conference, and negotiations are underway with business companies. This is an awesome story, and clearly the product is created exactly for mass consumers.

**— What financial reward can be hoped for by the participants of the contest?**

— Our prize fund amounts to 2 million rubles, for young people this is good money. We have two options for reward. One option is grants, and we are monitoring the targeted utilization of the grants. The second option is a personal reward, which can be used at the discretion of the winner. Our partners, companies operating in the market provide rewards to those participants, whose projects are recognized the most promising. To be honest, we have long been racking the brains about how to do that in a legally shrewd form. It is important anyway to support the kids in a right manner to have them stick to their business they love so much.

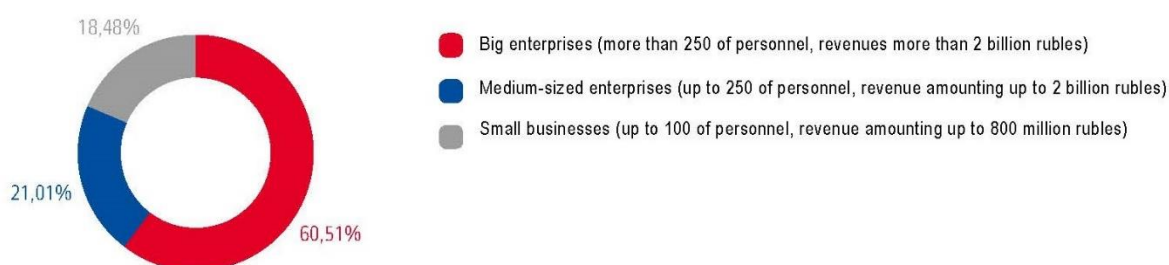
— Let's now talk about small and large enterprises in the industry. According to the survey titled "The Portrait of Russian Radio Electronics Industry" and published by your institute, the industry is dominated by large enterprises, while the share of small businesses in radio electronics industry is less than the figure reported for the economy as a whole. Given that and also as the experts' say, it is necessary to join efforts by establishing consortia, will there be a place for small businesses in radio electronics industry?

— In my view, to have a successful economy, the small business shall have a 50% share of the market. Nevertheless, this does not mean that Rostech strategy is wrong. It is elaborated very competently: the corporation's goal is restructuring of enterprises in each industry, to assemble them into strong holdings and thereafter to attract private investors, and also becoming less dependent on governmental subsidies.

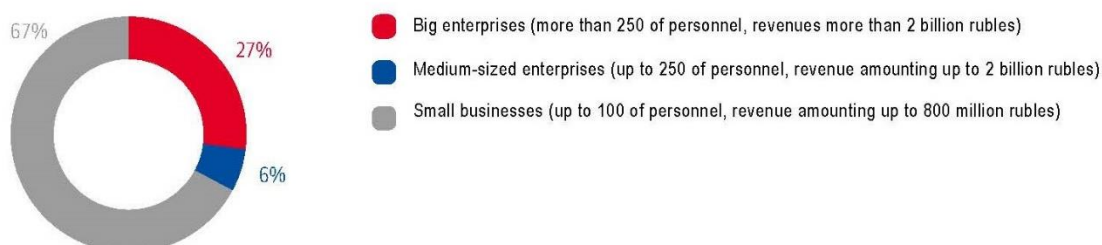
The government must always help strategically important sectors, such as microelectronics or projects like MS-21, which will secure leadership positions for our country. It is required to be flexible in the innovation economy to be capable to make fast decisions. The same goes for both the small and medium-sized business, and it is necessary to have the share in the economy growing and prevailing.

#### THE PORTRAIT OF RUSSIAN RADIO ELECTRONICS INDUSTRY

##### **BUSINESS SIZE (INDUSTRY ENTERPRISES)**



##### **BUSINESS SIZE (RUSSIAN ENTERPRISES, STATISTICS OF FEDERAL STATE STATISTICS SERVICE)**



— And what market niches are available for small businesses? After all, there is no tradition in Russia to develop popular consumer goods, this is the USSR holdover, where the stake used to be made on the defence industry. Obviously, this is true as well for electronics industry.

— It is true, our industry is specific, it is represented to 90% by defence enterprises. Unfortunately, most of them are quite inert about development of civilian directions of business, and this is a promising window for opportunities created for small businesses. Enterprises of the defence industry complex, and not only those related to the electronics industry, I want to emphasize this point, are currently searching for new ideas and projects, and they are ready to actively cooperate with both small businesses and scientific research groups created under universities.

**— Do you see any positive results of this process, or is it too early to talk about results?**

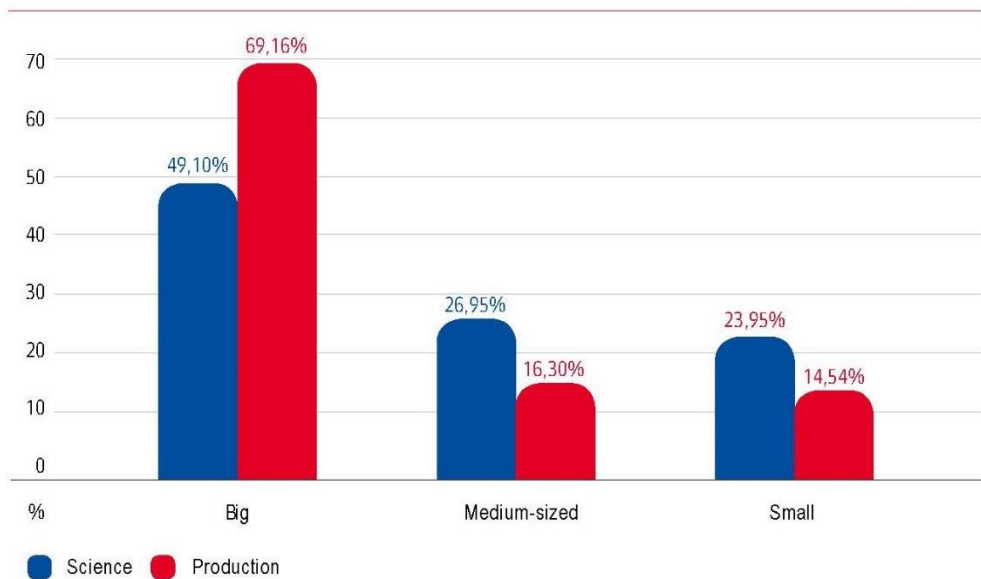
— Perhaps, the problem is in popularization, but I would not dare to rate top ten successful university projects. Although they are taking the right steps. It seems to me, however, that a comprehensive chain of communications between teams, universities and external stakeholders has not been established as yet, and this often prevents the achievement of the expected results.

**— What should they do to establish partnership relationships?**

— If this is really a work focused on results, rather than for the sake of indicators of educational ratings, let them come to us. We work with 56 universities all over Russia and Commonwealth of Independent States. We do not ask anything from them, except that they must announce the project and communicate to the youth the information about the opportunities the contest gives.

Naturally, our project itself has long been some kind of accelerator for projects at earlier stages of development. They are growing with us and they become more interesting for funds and innovative partners like Rosnano and Skolkovo. We actively cooperate with them, we have them informed about projects and teams, we organize joint events and activities, and their representatives have already become members of our experts group and the jury at the final stage of the contest.

**SIZE OF BUSINESS (RESEARCH AND PRODUCTION ENTERPRISES)**



**— Let's get back to the popularization of engineering professions. What should be undertaken in this regard? Should the Government take care of that?**

— Indeed, this is a big problem. I will give you an example: our developers have created a domestic, quite competitive product, Baikal processor. It's a domestically produced machine! This is a great victory, but very few people are aware of it. At the same time, corporations such as Intel and Samsung hold olympiads in Maths and robotics, thereby preparing the lists of their future employees. And who prevents us from conducting similar activities?

By the way, starting from this year, we launch programs at schools, so far at one school. The idea is as follows: in large holdings such as Intel there is a practice: children draw pictures and answer the questions of psychologists, and then the company develops a product based on observations of the child's psyche, which is not yet filled with stereotypes. We also want the younger school children to fantasize: for example, about the future medicine, about space exploration, and even about creating a robot for sewing dresses in space. Then the secondary school will formalize and develop this idea: we will conduct for them master classes on programming and 3D-modeling, we shall tour them around the laboratory. And we shall give to the senior pupils a more serious technical task, which is to be based on the previous stages.

**— Is this program also targeted at the popularization of science and technology?**

— Our main goal is to stop the outflow of human capital from Russia abroad, and the contest was born with us as a proactively initiated project. As the General Director of Electronics Central Research Institute, I did not set for myself such a task, and if the contest is to be terminated tomorrow, nobody would scold me for that. But I'm unlikely to be able to abandon the project: now it's also a big responsibility for young minds – we must not let them afraid of difficulties at the initial stages, we must prompt the right

way, to teach them to defend and promote themselves and their ideas. And then, it's so great to build a community of kids who got acquainted with each other, communicate, fall in love, who have the power and a great desire to jointly create the technological future in which our children will live. Therefore, our project is for them – for talented young people, who need help.

**– But in fact your work is connected not only with the contest of youth innovative developments. Electronics Central Research Institute is the main developer of such documents as the Strategies for Development of the Radio electronics Industry of the Russian Federation for the period to 2030, the State Program for Development of the Electronic and Radio Electronics Industry for the period to 2025. According to these concepts, what kind of radio electronics will be in demand by the Russian economy – whether it will be mass consumer, military, or industrial products?**

– Domestic radio electronics today is being actively changed: organizations are adapting to new market conditions. Like I said, they are gradually shifting from the prevailing share of the state defence procurement, and they are targeting their new development strategy on manufacture of competitive civilian products. The volume of the military products market has reached its peak and cannot, as before, serve as a basis for the growth of industry performance indicators. Therefore, the industry management takes measures for diversifying the product portfolio of the radio electronic industry enterprises towards the civilian segment. Serial production of the first participants of the state program is scheduled for the upcoming 2-3 years, therefore, it will be possible to expect increased domestic radio electronics production and, accordingly, an overall decline of imported products share of the market.

Many initiatives are also implemented for support of domestic producers by assigning them a special status that gives preferences in selection of supplier. Also, a great work is being done for development of domestic microelectronics, because the component base determines the key competitive advantages of the final product.

**– At the end of 2017, the institute became a member of the technical committee for standardization (TK 159 – Hardware and software for distributed registry and blockchain technologies). How is the work progressing in this direction? When should we expect the publication of the standard?**

– Yes, indeed, such working group has been formed and the work is under way in this direction, but for the time being it has a rather preparatory and analytical nature and is connected with the study of the subject area. We are monitoring this process and will be prepared to come up with specific propositions.

**– Will the Russian standard be consistent with international standards?**

– Of course, the work on standardization will be performed with allowance for the global experience. Harmonization of the Russian and international standards should become one of the essential provisions of the designed Strategy for development of the radio electronic industry.

**– Whether the developers and start-ups should slow down their work so that their idea would not appear to be conflicting with the adopted document?**

– Start-ups and developers should not slow down the work processes in this direction. It is exactly the high quality scientific and engineering study that will help to formulate a competent approach to the development of the Russian standards in this breakthrough direction.