ISTC projects benefit scientific and technical development

The ISTC has reviewed the results of ISTC completed projects in the area of:

- nuclear safeguards;
- radiation sensors and their application;
- oil and gas.

The work was finalized in June 2012.

Results

The reviews carried out in the three sectors showed that the ISTC funded work was:

- executed on a cost-effective basis. There was value for money;
- served as a trigger for further scientific and technological development. The funding albeit limited in volume had the function of a "building block" promoting scientific discoveries;
- a factor preserving science in the countries concerned. In various cases scientific know-how was developed and expanded;
- a reason to start networking with colleagues both inside and outside the CIS. In most cases the role of foreign collaborators in project execution was positive;
- a substantial contribution was made to non-proliferation objectives.

A common weakness was the lack of systematic dissemination of the results of the work to (foreign) stakeholders respectively by the ISTC secretariat and the lead research institute. With respect to the latter, obstacles related to language skills played a role as well as the cost related to obtain an international patent.

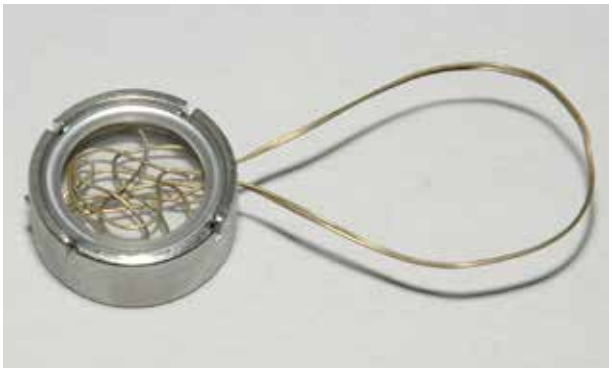
Specific conclusions per review area

Nuclear Safeguards

The Review Panel responsible for the sector of nuclear safeguards, safety, security and related issues considered 16 projects.

The following conclusions were formulated by the panel:

- The reviewed projects triggered developments of techniques which were relevant to the peaceful use of nuclear energy and to non-proliferation;
- These projects helped to keep essential know-how within the Russian Federation, and, particularly in the field of nuclear safeguards, promoted new developments which enhanced the quality of operational systems;
- As the results of ISTC-funded projects led mainly to applications within the Russian internal market, there is a potential for extending these applications at the international level, notably through the IAEA; this should be further exploited;



- The available language skills of those involved in the projects constituted an obstacle for publishing results internationally; the same applies to IPRs' protection at international level. The impact of such obstacle should be mitigated by appropriate measures.

Radiation Sensors and their Applications

The Review Panel responsible for the sector of radiation sensors and their applications considered 35 projects.

The Panel came to the overall conclusion that technologies were developed to be used for the prevention of illegal trafficking of radioactive materials including nuclear materials accounting and control. Identified technologies with commercial potential can contribute for example to the work of IAEA in the field of nuclear safeguards.

Since sensors and detectors can often be more widely used there is the potential for applications in other sectors such as in the field of biomedical applications and to promote homeland security.

The funded work that contributed to the Large Hadron Collider experiments at CERN was of outstanding quality and

fostered excellent collaboration between Russian and Western scientists.

In addition:

- There was good value for money, proper project management as well as high-quality collaborations both nationally and internationally;
- In particular the high energy physics projects stand out. The Panel members remarked that these projects provided a major contribution to the muon detectors for the ATLAS system at the Large Hadron Collider in CERN. ISTC funding for these high energy physics activities provided a major opportunity for scientists from the CIS nuclear weapons laboratories to engage with world-class "Big Science";
- The Panel recognized the future of the scientific and technological endeavors funded by ISTC depend heavily on policy and economics rather than on scientific and technical issues. From this viewpoint, it is unlikely that most of the R&D carried in this area will spawn new, thriving or even self-sustaining industrial spin-offs that can survive without government support;
- The review revealed that many of these projects have a long way to go (both time and funding) before they can produce and market a product at a profit;
- Some, however, have shown they can satisfy a niche for unique equipment that scientific research or national security requires, but they do not lead to products appropriate for the consumer market. Others can be used more widely. Thus there is good potential for their employment in other sectors such as in the field of biomedical applications and to promote homeland security if and when market conditions are appropriate;
- ISTC has to improve the external relations component regarding the work funded so that the project results receive a better and broader dissemination;
- The future cooperation on basic research is a definite possibility, provided that there is a convergence of mutually beneficial interests that will lead to local (as opposed to grant or contract-based) funding of activities.

Oil and Gas

The Review Panel responsible for the sector of oil and gas considered 17 projects.

The panel came to the following conclusions:

- There was overall agreement that projects were relatively cost effective and met non-proliferation objectives;
- All project managers interviewed presented information that showed that after their ISTC projects ended they continued their research and commercialization efforts. These projects were generating revenues. The following observations were made from their presentations:
  - Contracts were signed with British Petroleum to field test the bore hole cleaning technology from project 3525 at 300 wells in Russia. (Project ended 7/2010).
  - Gazprom is supporting follow-on development and production of the small capacity fuel cell based power plant produced from projects 2904/3908. (Project ended 7/2011).
  - Large scale field tests were recently conducted at oil wells in CIS using the bore hole chemical treatment technology developed in project 0985 with further enquiries about the technology from companies in the US and the UAE. (Project ended 10/2002).
- There should be better planning from the onset of projects on how to protect IPR;
- Mechanisms and incentives be considered to increase dissemination of non-proprietary project results in international peer reviewed journals and international conferences.

Three reports

ISTC has published three reports respectively on:

- nuclear safeguards;
- radiation sensors and their applications;
- oil and gas.

The reports can be downloaded from the ISTC website: www.istc.ru or can be ordered via e-mail to Mrs Elena Zaitseva of ISTC: **zaitseva@istc.ru**