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THE INTERNATIONAL SCIENCE AND TECHNOLOGY CENTRE (ISTC) IN
MOSCOW : RESULTS AND PROSPECTS

INTRODUCTION

1.1 The ISTC: a practical example of successful cooperation in a highly sensitive field

The end of the Cold War and the dismantling of the former Soviet Union's administrative structures brought the Soviet Union's research and development activities in the field of weapons of mass destruction to an abrupt halt. Researchers in this field saw their standards of living plummet and the opportunities to use their know-how shrink. There was a real danger of a mass exodus by Russian scientists towards countries with unstable rulers possessing or developing nuclear weapons.

The Russian government was quick to realize the gravity of the situation. At a meeting with the US Secretary of State in Washington in November 1991, the Russian foreign minister proposed that an international scientific research fund be set up to keep Russian scientists and engineers specializing in weapons of mass destruction from succumbing to tempting offers to sell their knowledge and know-how in the world's trouble spots. On 27 November 1992 the United States, Japan, the European Communities and the Russian Federation signed an agreement establishing the International Science and Technology Centre (ISTC) in Moscow. The board met for the first time in March 1994, adopting the ISTC's statutes and making the first grants for approved projects. In the past two years the ISTC has handled over 500 proposals, amply illustrating the importance attached to the Centre by the military research institutions and the government departments above them.

The conversion experience built up by the ISTC is helping the military institutes gradually adapt to the international scientific environment without losing their human capital. The development of new scientific concepts in the civilian sphere and the introduction of modern project-management methods offer military scientists a rare opportunity to adjust their thinking to the needs of civil society and improve their international competitiveness.

If the quality of the topics proposed and the breadth of the fields touched-on show the competence of the teams and the excellence of their R&D work, they also demonstrate the firmness of the ISTC's partners' commitments. The average investment of ECU 300 000 per project financed is a gauge of the donors' readiness to commit themselves to well-defined and clearly-targeted projects on a scale sufficient to bring about the genuine conversion of military scientists.

1.2 The Communities' crucial commitment to the ISTC

The Community's role in this initiative is to help restructure military R&D in the New Independent States (NIS) by contributing to civilian projects employing scientists previously engaged in developing weapons of massive destruction. It is also to select, through the ISTC, projects that might interest European scientists, researchers and industries. As Table 1 shows, Europe is matching the United States' contribution to the ISTC's funding.

Table 1: budget commitments of the ISTC's partners (ECU million)

	United States	EC	Sweden	Finland	Japan
1994	20	20	3.1	1	14.1
1995	19	10			
1996	12	15			
Total	51	45	3.1	1	14.1

The ISTC is a central element of Community R&D cooperation with the NIS, the others being: INCO-Copernicus, which is aimed at preserving the R&D potential of the countries of Central and Eastern Europe and the NIS with a view to helping resolve social, economic and environmental problems and stepping up R&D cooperation; INTAS (International Association for the promotion of cooperation with scientists from the NIS), which mainly funds joint research projects by scientists of the INTAS countries and the NIS, finances seminars and grants bursaries to foster mobility among researchers. These programmes attract comparable amounts of Community funding: in 1996 the ISTC was allocated ECU 15 million, INCO-Copernicus's activities in the NIS ECU 14 million and INTAS 14 million. Where the ISTC differs from the other two programmes is that it funds projects wholly executed by NIS scientists and also involves financial support from the United States, Japan, Sweden and Finland and contributions in kind from the Russian Federation. By October this year, the ISTC's partners had invested a cumulated total of ECU 96 million in 324 projects lasting from two to three years on average and involving 15 000 researchers. By the end of the year INTAS's partners will have invested a total of ECU 60 million in 1 200 projects.

2. ORGANIZATION AND OPERATION OF THE ISTC

The ISTC was set up with the long-term goal of redirecting the R&D efforts of Russian military scientists and engineers towards peaceful activities. Though part of a wider defence conversion effort, the principal motive for the ISTC project is the need to prevent the proliferation of technologies and know-how relating to weapons of mass destruction.

The ISTC is also governed by a legal framework laid down in its statutes, which accord the inventor intellectual property rights while offering the donors an exclusive and inalienable right to use that invention free of charge on their territory.

The ISTC has a secretariat, a board, a coordinating committee and a scientific committee. It selects, finances and supervises scientific and technical projects. What is unusual about the ISTC is that it pays researchers directly - not institutes or laboratories - in US dollars, thereby gaining their trust and encouraging effort.

The ISTC is open to all the NIS. Besides Russia, the signatories to the agreement establishing the ISTC are Armenia, Belarus, Georgia, Kazakhstan and Kyrgyzstan. For political reasons Ukraine has preferred to set up its own centre. The ISTC has its headquarters in Moscow and branch offices in Minsk (Belarus) and Alma-Ata (Kazakhstan). Community funding is channelled through the TACIS programme, which provides technical assistance to smooth the passage of the NIS and Mongolia to a market economy and democracy. The ISTC's projects complement nuclear safety, energy, environment and telecommunications programmes already contributing to the conversion of many scientists and engineers, regardless of whether they had previously been involved in the production of weapons of mass destruction.

3. THE ISTC'S ACHIEVEMENTS

In a context as complex as the former Soviet Union's tactical and strategic weapons research, the very fact of the ISTC's existence - that it has survived and developed smoothly - represents an unqualified success. This is attributable as much to the Russian government as the international donors (the Communities, the United States and Japan). The number of projects financed, the nature and variety of the sectors concerned and the cooperation network built-up all attest to this success.

3.1 The number and scale of the projects financed

In October, after two and a half years of operation, ECU 96 million has been invested in 324 projects directly involving 15 000 scientists previously employed in the development of weapons of mass destruction, over 3000 of them members of the hard core of military researchers.

3.2 The projects' fields

ISTC projects cover a wide range of scientific and technical fields; they reveal the broad outlines of a development strategy based on the exchange of knowledge and the introduction of modern production, safety and quality methods.

This is particularly true in the nuclear field, which for reasons rooted in the Soviet past accounts for almost half of the ISTC's activities. These activities include safety analysis, especially in respect of rapid shutdowns, the recycling of military plutonium and waste storage, the production of reports on marine and soil pollution, the introduction of monitoring and safety procedures for fissile materials, the transport of materials and the development of seismic monitoring equipment.

ISTC projects in the field of basic research contribute to the integration of the international scientific community. Examples include CERN's ISTC projects, projects concerning space exploration and others in the field of thermonuclear fusion, and in particular the International Thermonuclear Experimental Reactor (ITER).

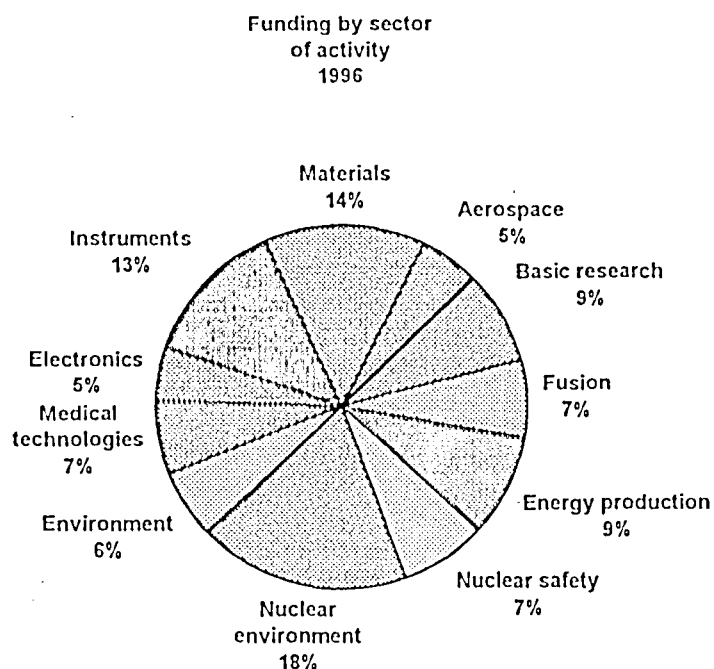
The health sector offers biological warfare specialists an opportunity to redirect their efforts into the development of new vaccines and the introduction of modern production methods in the pharmaceutical sector.

Chemists are working to develop ways of destroying chemical weapons which could prove important in the future, or studying methods for fighting fires in industrial plants or oilfields.

Those specializing in launchers are now finding a natural home in the civil aerospace sector. This area of activity accounts, however, for only 5% of the ISTC's activities and should be improved with the backing of the European Space Agency and the aerospace industry.

The ISTC also offers a vantage point from which to identify particularly interesting areas of Russian science, promotes projects and acts as a catalyst for new activities.

Graph 1: Sectoral breakdown of CIST projects



3.3 The network formed

With more than 150 military research institutes involved in ISTC projects, conversion to civilian activities is becoming a fact of everyday life, especially for the prestigious institutes handling many of the projects, among them Arzamas (37 projects), Chelyabinsk (24), Bochvar (11), Kurtchatov (12), Lebedev (8), Ioffe (7), the Moscow Institute of Physics (8), NPO Vector etc. Since Perestroika, the ISTC is the first international organization to have gained access to the closed cities where, in a climate of high security and isolation from the world, scientists worked to develop weapons of mass destruction.

An effective international instrument for assisting research and technological development, the ISTC is now part of the broader framework governing research policy in the NIS.

Its success can also be gauged by the scale of the cooperation between teams from the NIS and the Communities. About 200 European research institutes, universities and firms are involved in projects to some degree: examples include the Forschungszentrum Karlsruhe, Rossendorf, CEA, BNFL, ENEA, Siemens, Ansaldo, Framatome, Airbus, Codema and the Commission's Joint Research Centre. European firms and institutes see the ISTC as an opportunity to work with once-inaccessible institutes enjoying a reputation for excellence in advanced technologies. It is also a gateway to the new Russian Federation, enabling them to forge long-term working relationships with defence laboratories and manufacturers working in fields associated with ISTC projects. By systematically fostering cooperation with European organizations on a case-by-case basis, the Commission is contributing to a wider debate on ideas and approaches in the fields of advanced and applied R&D. The knowledge accumulated by the former Soviet Union's defence institutes combined with European know-how is helping weave lasting and mutually-beneficial links between members of the international scientific and industrial community.

Though such working relationships are often slow to take root, they foreshadow future cooperation between the Communities and the NIS, and especially the Russian Federation.

4. THE ISTC'S PROSPECTS

4.1 General outlook

Success should not obscure the need for adjustments to make the ISTC even more effective. It has to get the different administrations to recognize its international status and improve access to the closed cities, for which entry permits can still take over 35 days to obtain. The tax-free salaries are also becoming less attractive as time goes by, which could slow down conversion if not adapted to current economic conditions, especially in Moscow. In the Russian Federation, bilateral programmes are sometimes frowned on owing to a certain ambiguity about matters of principle, especially where intellectual property is concerned. This is not the case of the ISTC, which needs to be seen as cooperative, law-abiding and useful to the nation. This has to be brought home to the political authorities, among them the Duma, which is paying increasing attention to the ISTC's activities. In Russia's current political climate, the Duma's support, like that of the President, is crucial to the ISTC's success.

In the Communities, the political will to back the ISTC is reflected in an increase in its budget from this year on. This makes the Communities a key partner for the Russian Federation. It coincides with the decision of the Commission and the United States to swap the post of ISTC director for that of chairman of the board, which is currently held by the Communities.

The ability to organize a genuine follow-up to projects, and in particular the application of results, must now be the ISTC's key operational objective. The work must be carried on organizing effective partnerships with Western or Japanese institutions willing and able to play a serious part in projects.

The organization of such partnerships and the introduction of rigorous methods for the scientific management of projects will probably take up most of the ISTC's time in the months ahead. Its secretariat is now developing a more dynamic public relations policy. In the Communities, the Commission and the Member States must continue their information and awareness efforts, drawing on the practical examples now available.

The ISTC alone will not have the means to pursue this policy while ensuring the survival of the projects promoted by it. Other sources of public- and private-sector funding will have to take over from projects that have served as an opportunity to evaluate and confirm the scientific and technical capacities of several hundred research teams. The "ISTC brand-name" should help those executing projects to attract funding, be it grants from the Russian government or contracts with Russian or foreign firms.

4.2 The Communities' contribution

The Communities must therefore endeavour to organize long-term cooperation with European industry and research institutes. To do so, the Commission and the Member States must capitalize on the ISTC and back the development of technologies and knowledge in the future's key sectors. They must therefore continue and step up their efforts in respect of the ISTC, using it to:

- organize partnerships in civilian sectors between European organizations and military research institutes in Russia and the NIS;
- foster a policy of exchanges and familiarization with practices in Russia and the NIS in order to gain the experience needed to carry through other industrial and commercial schemes;
- foster harmonization with a view to establishing common methods and standards (health, energy, environment).

Another way of capitalizing on ISTC projects is to put them in touch with international cooperation programmes or major projects. The ISTC's projects in support of ITER are a typical example of this. The ISTC could step up these efforts by involving the JCR's institutes to a greater extent, supporting projects that international programmes would otherwise be unable to develop.

The qualities and know-how of scientists working in military R&D centres could also be used for the application of the international treaties on the destruction of chemical and biological weapons or banning nuclear testing.

Under the TACIS programme, new synergies will have to be created between ISTC and TACIS projects in the sectors of conversion, industrial

restructuring, telecommunications, nuclear safety, the environment and energy. For example, a TACIS project aimed at restructuring a military plant could, if that plant employed scientists specializing in the development of weapons of mass destruction, be combined with an ISTC project in which the plant's scientists would study applications with direct or indirect commercial prospects, provided the project had the backing of the country's relevant authorities.

The key elements of this policy call for: a real increase in the budget allocated to ISTC under the TACIS programme; the promotion of cooperation among potential European partners and civilian and military industries in the Russian Federation and the NIS; the reinforcement of the conditions governing the scientific management of projects; the stepping-up of the European presence in the ISTC's secretariat by the secondment of new project managers; the formal involvement of the Communities in Ukraine's new centre for science and technology; the integration of the ISTC's activities into the policy on scientific and technical cooperation with the NIS; the opening-up of cooperation and assistance programmes (TACIS, COST, EUREKA, the fourth framework programme etc.) to ISTC projects with a view to long-term economic partnership; lastly, the commercialization of projects' results via patents in Europe and throughout the world.

5. CONCLUSION

The first two years of the ISTC's activity have been characterized by the success of the formula. As a multilateral centre receiving, selecting, developing and executing scientific and technical projects aimed at giving CIS scientists specializing in the development of weapons of mass destruction an opportunity to work on civilian activities with longer-term prospects, the ISTC has fulfilled one of its key objectives.

This success should not, however, be allowed to obscure the scale of what remains to be done. The ISTC is entering a period of consolidation: monitoring the many projects launched since 1994 and capitalizing on their results must be to the fore. This is also a transition period for the teams working on these projects, who must, with the ISTC, identify and introduce structures enabling them to commercialize their work in the relevant sectors of the market. Ultimately the projects will have to quit the umbrella of the ISTC, seeking backing from research institutes and industry instead. Only when this process has been completed will the ISTC have fulfilled the objectives of converting military scientists to civilian activities.

ISTC projects must therefore be chosen in the light of the industrial spin-offs they can generate, private partners must be sought from the outset, and funding taken over bilaterally by the Member States once ISTC funding comes to an end. The JRC must become an active partner in ISTC projects. It could help tighten links with institutes in the CIS and orient projects to the needs of industry by allowing the ISTC to draw on its cooperation network. A real effort must be made by the ISTC's backers to find partners, which means that the Communities must mobilize resources commensurate with the task at hand.

The Commission will therefore be strengthening the existing structure, bringing into play, on the one hand, the political, administrative and financial part (TACIS) and, on the other, the scientific and technical part by coordinating activities with industry in the Member States and the relevant European bodies.