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RUSSIA AND CEE: THE NUCLEAR CHANCE THAT SHOULD NOT BE MISSED

Speaking about the prospects for the promotion of Russian nuclear technologies in Central and Eastern Europe (CEE), I have to note that the review of Russia's nuclear presence in the region published in this issue of *Security Index* is detailed enough. After the dismantlement of the ideological pressure, commercial ties with Central European nations in the area of nuclear energy continue to develop with significant success. Russia complies with its commitments related to nuclear fuel supplies, return of spent nuclear fuel for storage and reprocessing, or modernization of existing power plants. During these years there has been no blackout in the region, where nearly half of electricity is generated at the Russia-designed nuclear power plants (NPP). *Quae sunt Caesaris Caesaris* – whatever political environment is, nobody wants to read by the light of the pine splinter.

Obviously, politics matters. Sometimes this factor plays technical and economic role without any serious arguments behind it – such things happened in Bulgaria and Lithuania, where the third and the fourth units of the Kozloduy NPP and the first unit of Ignalina NPP were shut down early. In 2006 Bulgaria was the largest electricity exporter in the region – with the amount of 7.8 billion kWh, it covered about 80 percent of the energy deficit in the neighboring countries (Albania, Greece, Macedonia, Romania, Serbia, and Turkey). The licenses for operations of Kozloduy-3 and 4 were valid until 2010 and 2012 respectively. No wonder that now it is not only Bulgaria, but also *victims* of power shortage, that appeal to the European Union with the request to extend the use of reactors.

Clumsy attempts of the EU officials to explain the early closure of the reactors by «insufficient safety level» are hardly convincing to specialists. First of all, one has to admit then that many-year billion-dollar investments in the enhancement of nuclear safety of Russia-designed reactors have been spent in vain. And this was the money of taxpayers allocated by international institutions under such programs, as *PHARE*, *TACIS*, etc. Secondly, the Europeans surprisingly forget the statements by the IAEA and WANO that Paks NPP in Hungary and Loviisa NPP in Finland are considered to be the safest and the most reliable nuclear power plants in the world. And these two plants are equipped with the second-generation reactors – *VVER-440 (B-213)*.

The desire of the Europeans to reduce energy dependence on Russia results in the impediments for the Russian companies to buy shares in the energy production and distribution assets in the region. EU's unofficial quota for import of uranium production from Russia (in accordance with the so called *Corfu Declaration*) is nothing else, but a political barrier. We do not need any special preferences on the European market, but it is not reasonable from the point of economics and technology to set up artificial discriminative constraints either. Let the technologies, not ideologies, compete. Political bias may lead to some unexpected outcome.

For instance, on the eve of President Bush's visit to Ukraine, Kyiv decided to sign a contract with *Westinghouse*. The U.S. company pledged to supply fuel assemblies to Ukrainian NPPs.



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This step was, in fact, beneficial for the Russian monopolist – *TVEL*. Since the cost of U.S. assemblies is 25–40 percent higher, the Russian corporation is now free to set a new price as well.

The technical ambiguity of this experiment was proved by the accident at the nuclear plant in Temelin in the Czech Republic. The same attempt to change the supplier ended up with the failure and refusal to cooperate with the U.S. company. Finland also prefers Russian fuel for the NPP in Loviisa. At the same time, such Western expansion into the traditional Russian nuclear fuel markets in Central and Eastern Europe has encouraged Russian manufacturers to speed up the introduction of innovations (i.e. new fuel assemblies – TBCA). One also has to note that nearly three quarters of *Westinghouse's* shares belong to Japan-based *Toshiba*, which has recently signed a framework cooperation agreement with *Atomenergoprom*, the Russian holding which comprises *TVEL*. Are we going round in circles?

To assess the prospects of Russia's nuclear technologies in Central and Eastern Europe, one has to look at the existing basis and the prerequisites for cooperation. A short history lesson. As long ago as in 1956 the Soviet Union signed its first agreements on technical assistance in construction of Reinsberg NPP in East Germany (pressurized water reactor with the capacity of 70 MWe) and Bohunice NPP in Czechoslovakia (*A-1* heavy water reactor with the capacity of 150 MWe). Later on, until its collapse, the U.S.S.R supplied socialist countries of Eastern Europe with nuclear power plants, nine research reactors, six cyclotrons and seven radio-chemical laboratories. The construction of these facilities gave impetus to education and training of national professionals, who knew how to deal with the Soviet/Russian nuclear technologies. The number of such specialists amounts to dozens of thousands.

The Council of Mutual Economic Assistance (CMEA or COMECON) played special role in integration and specialization of CEE nations in nuclear energy sector. Large production facilities were set up to manufacture certain components of NPP equipment. Czechoslovakia possessed enterprises that produced *VVER* reactors, including the most wanted equipment with the long manufacturing cycle – vessels of reactors, steam generators, etc. By the way, *Škoda Alliance* benefited from the heritage of socialist integration and together with *Westinghouse* competed with Russia at the tender on construction of Belene NPP in Bulgaria with Russia-designed *VVER-1000* reactor. One must add that the major Czech enterprise of nuclear machine-building – *Škoda JS* – belongs to the Russian *Alliance of Machine-Building Plants* (OMZ). Again we are making a circle.

An illustration of the Russian practical capabilities in this area may be two units equipped with third-generation *VVER-1000* reactors in Tianwan in China. The units were built by *Atomstroyexport* and became commercially operational in 2007. At present, it is the most advanced NPP in the world, which has active and passive security systems, unique know-how, including the container for core melt in case of accident beyond the design basis, digital system of automatization and management of technological processes, and other innovations. Nuclear reactors that are being built in India and Bulgaria should be even better. The participation in construction projects abroad helped us to preserve Russian production plants, professional staff, including designers, nuclear engineers, construction specialists and top managers.

There are many examples that prove – integration and specialization within the CMEA was not meaningless. Bulgaria produced the systems of biological protection, transportation and technology equipment for NPPs; East Germany made overhead cranes and special fittings; Hungary was in charge of equipment for specialized purification of water, refueling machines and large-diameter wrenches; Poland manufactured heat-exchange equipment, pressurizes, reserve diesel plants; Romania produced key circulation pumps and coolers for the cores; Yugoslavia made special pumps, overhead cranes, fittings, etc. The cooperation goes on now in the course of modernization of existing plants and construction of new ones. The scale is smaller, but still – the construction of the Tianwan NPP in China involved the use of materials and equipment manufactured in a number of CEE states.

To sum it up, one has to admit that in the recent decades there was created a solid basis for continuing nuclear energy cooperation with the countries of the region. Beside machine-build-

ing facilities and professional human resources, Russia and CEE are connected with the common school of design and standards. Nowadays when these countries introduce the EU legislation, we will have to harmonize norms and standards. The construction of the Belene NPP is quite an eloquent example – after all possible feasibility studies and examination the Russian project was eventually certified by the EU. So we have a precedent.

Eastern European market creates a unique opportunity for integration of Russian and Western technologies. There are only four-five transnational corporations in the area of nuclear energy that are capable of building modern and safe nuclear power plants. Strategic alliances can be forged for specific projects. During the construction of the Tianwan NPP, *Atomstroyexport* maintained close cooperation with the French-German *Areva NP-Siemens*, as far as instrumentation and control (I&C) systems were concerned. Such interaction is also envisaged in the course of implementation of the Belene project. Now it is not a matter of construction of nuclear power facilities, but more a matter of business diversification – development of appropriate infrastructure, joint use of the power plant, electricity sales, complex maintenance services during the entire life cycle, and decommissioning.

Global nuclear power sector will reach a critical point in the next twenty years – there will be a need to find an urgent solution to the issue of safe management of spent nuclear fuel and radioactive wastes. So far not a single serious power plant in the world has been decommissioned to *green grass* level. CEE countries possess many closed or temporary closing-down nuclear reactors. This *test range* could be used to join the efforts of Russian and Western experts in developing advanced technologies of decommissioning, reprocessing and safe disposal of wastes. One cannot rule out that in the near future such business may become more profitable than construction.

The long era of stagnation in construction of nuclear power facilities is over. We are facing the epoch of nuclear renaissance. CEE states start to voice their national plans of nuclear energy development – first cautiously, looking back at Brussels, and then at the top of their lungs. The reasons are well-known – increasing energy consumption, enormous prices of hydrocarbons, the need to diversify sources of energy, and climate change. Unlike in Western Europe, general public here does not demonstrate substantial opposition to nuclear energy and the infrastructure exists as well. The EU has a vivid discussion on auctions for industrial corporations – they have to buy quotas for carbon dioxide emissions. If such decision is taken, it may boost the construction of new safe NPPs, which are much more environmentally friendly than power plants using coal or gas.

However, the issue is not that simple. Most of the new NPPs in Eastern Europe should be built with the help of private investments, above all, large Western companies and banks. The latter hesitate because of the high costs of projects, lack of assurances about security of investments, and political uncertainty in some countries. Bulgaria confronted all these difficulties when it was selecting financial partners for Belene. It is always difficult for pioneers. This is why the involvement of Russian private capital, establishment of joint ventures (such as *Engineering Procurement Construction Management*) should not be hampered by European bureaucrats and may become an alternative solution. Russian manufacturers of equipment and engineering companies, unlike their Western colleagues, continued to build nuclear plants in India, Iran, or China during the nuclear *break*, and we have a lot to offer to our partners. Such industrial and financial alliance would be useful both for energy sector of Eastern Europe and Russia, and for joint conquering of the third markets.

Russia has recently announced the decision to construct an NPP in Kaliningrad. By 2015–2016, it is planned to build a two-unit NPP with the capacity of 2,300 MWe. Two *VVER-1000* reactors (belonging to «*generation 3+»*) will be installed there. The estimated cost of the project, including infrastructure, is 5 billion euro. For the first time in Russian history, foreigners, notably Europeans, are offered 49 percent of shares of the future company. Leading European energy corporations have demonstrated their interest. Lithuanian authorities showed immediate negative response; as such construction may allegedly jeopardize the plans of Baltic states and Poland to build their own NPP for joint use. The Russian decision may also encourage the authorities in Belarus to speed up the decisionmaking process with respect to selection of the site and schedule of construction of its own NPP. Hence, *Rosatom's* deci-



sion may cause different comments, but this is a strong geopolitical move. There is a real chance of integration of Russian and Western technologies, but this should not be a *one-way street*.

Optimal use of existing economic ties with CEE in nuclear energy sphere, introduction of innovative nuclear technologies, search for new forms of cooperation, removal of political barriers – all these are components of successful mutually beneficial cooperation. 