

Sergey Antipov: "Plans on NPS dismantlement will be fulfilled by 2010"¹

Interview with Mr S.V.Antipov, Deputy Head of Rosatom from September 2004 till May 2006.

- *Sergey Viktorovich, It is known that international conference on the issues related to the approaching G8 Summit was organized by the PR-Centre and was held on 21-22 April in Moscow. At this conference you presented a report on state of activities on dismantlement of nuclear powered submarines (NPS). Please tell us what is a current state of NPS dismantlement work.*

S.V.Antipov: Within the frames of the G8 Global Partnership Programme against spread of weapons and materials of mass destruction, initiated in 2002 at G8 Summit in Kananaskis, it was decided to designate on these objectives 20 billion US\$ for 10 years. One tenth of these funds – 2 billion US\$ - should be allocated for NPS dismantlement. As of 1 April this year our foreign partners signed contracts on the total amount of about 438 million US\$, while at the same time Rosatom placed contracts on 292 million US\$ in total. As for the money that actually have been received, our foreign partners already transferred 313 million US\$ to Russia and at the same time Russia itself spent 250 million US\$ on resolution of the (NPS) problem. I should note that it is the first time when the total input of donors exceeded the Russian contribution. According the agreements they (*foreign donors*) pledged to contribute three times more than us. It means that finally the mechanism of international cooperation is taking a momentum, and the donor's assistance become a reality. The current state of financing and contribution of each country is given in the following Table.

Country	Declared funds, million US\$		Total cost of contracts, signed from July 2002 (NPS dismantlement)	Actually received money, million US\$
	Global Partnership Programme	including Comprehensive NPS dismantlement		
USA	10000	*	97.0	66.4
Canada	800	150	45.4	39.6
United Kingdom	750	200	68.12	43.4
Germany	1800	360	157.1	124.74
France	900	20	5.39	0.61
Italy	1200	430	0	0
Japan	200	100	6.7	6.7
Norway	100	100	35.4	27.2
Sweden			1.1	1.0
European Union	1200	48	3.95	0.96
Australia	7	7	0	0
NDEP		**	17.79	1.94
Total:	16957	1415	438.45	313.48
Russia	2000	600	292.5	250.1

¹ Interview with Mr. Sergey Antipov published in www.a-submarine.ru/News/Main/view?id=19500&idChannel=105 in Russian. Unofficial translation done by the CEG Executive Secretary. Original text is given below.

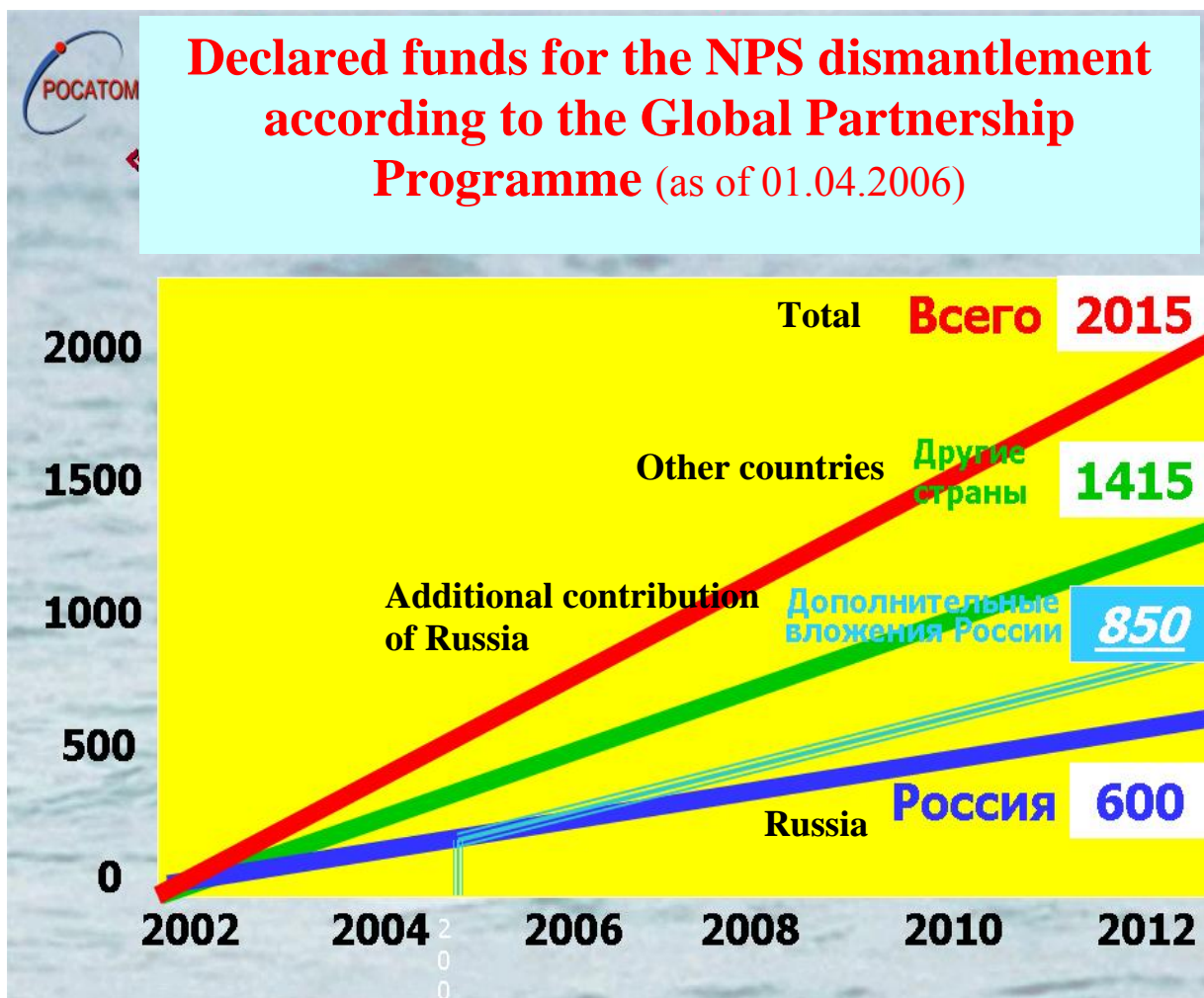
Notes: * According to the Common Threat Reduction Program (CTR)

** The Bank (EBRD) finances activities from the funds provided by the donor-countries.

I'd like to remind that early at the inception stage of the Global Partnership initiative we approached the whole international community with the proposal to cooperate in the area of comprehensive dismantlement and presented our proposals. The total sum required for completion of all activities constituted 4 billion US\$. But altogether GP participants, including Russia, are ready to finance only a half of the required costs. It means that the problem of comprehensive NPS dismantlement and related issues: removal of spent nuclear fuel (SNF), management of radioactive waste (RW) and remediation of the former coastal technical bases – will not be solved by 2012 in the whole scope, because the declared money is not sufficient. This tells that increase of funding is required.

What is a dynamics of distribution of the allocated money in time?

S.V.Antipov: During past years financing was stable. It is impossible to predict how financing will be developed in the future: whether it will speed up or low down, therefore to simplify the task let's assume a linear function. I.e. let's assume that in the future the funds will be allocated evenly, like now. In this case the rate of the money allocation could be illustrated by the following diagram:



I'd like to draw your attention on one specific feature of the given diagram. The money pledged by Russia for NPS dismantlement in a total amount of 600 millions from 2005 started to exceed the linear distribution. This is a result of the endorsement of the Federal target oriented programme "Dismantlement of Weapons and Military Equipment" which includes a sub-programme "NPS Dismantlement" according to which the rate of financing this task by Russia became higher than the declared obligations. It means that in case the Programme implementation continues (and now we believe in this), by 2012 Russia will allocate not less than 850 million US\$ instead of 600 million US\$ initially pledged. We would appreciate recognition of the fact by our foreign partners as an example and invitation to the future active actions. We finance NPS dismantlement with excess of the planned funds and we propose our partners to proceed in a similar way.

Since about half of money for the complete solution of the problem is lacking, as I said already, it would be advisable to investigate possibility to increase the obligations. Especially when it is known that from the funds pledged to the Global Partnership not all money have been designated to the tasks they should be spent on. Generally speaking: Germany has declared a total of 1.5 billion Euro (1.8 billion US\$), but at the moment 360 million US\$ have been designated to the NPS dismantlement, approximately a similar value to the chemical weapon (*elimination*) and 150 million US\$ - on the physical protection. And for the rest of money the decision was not made yet, therefore part of this money could fall under this task (*i.e. NPS dismantlement*). Our task now is to complete the work and our obligations that we emplaced on ourselves successfully and with a good quality, and to try to increase the total amount of the donors' obligations for assistance to the NPS dismantlement.

- And what is the scope of work completed under the funding received by Russia?

S.B.Antipov: Quite a large work has been accomplished under the allocated funding. It is simply impossible to list all tasks, therefore let's mention only the major ones, the largest projects that have been completed or in the implementation process.

The first direction is, of course, NPS dismantlement itself. The process is progressing according to the plans, quickly, and we are sure that all orders received from the Russian Government we will meet. In particular: NPS dismantlement will be mainly completed by 2010.

Second – construction of the long-term on-land storage facility for the reactor compartments in the Sayda Bay at Kola Peninsula. This unique project is being carried out with the assistance of Germany. A lot of discussion took place around the fact that Russia now does not have storage facilities that are suitable long-term and reliable storage of reactor compartments from the dismantled NPSs on land until the time when they could be handled further. Because of this any submarine dismantlement is not completed until the reactor compartment is placed on the solid dry basement. Now this storage facility is being constructed, and in July its first stage will be commissioned, and the first compartments will be placed there for storage. In reality these units already kept on-land: at the Nerpa shipyard the three-compartment units were converted in the single-compartment ones, and their preparation for the long-term storage is close to finalisation: appropriate treatment, back-filling of the open volumes, etc. In the middle of July we hope to have a 'cut the ribbon' ceremony and demonstrate to the world society the first reactor compartment units that will be delivered and placed for the long-term storage at this site.

The third direction of the cooperation is construction of the facility for unloading the interim storages of submarine's SNF in the Andreeva Bay and it's further management aimed to transportation to the Mayak enterprise. Another part of this work is construction of the infrastructure for management of radioactive waste that are stored now and will be produced there, and activities on remediation of the territory of the Andreeva Bay site. United Kingdom, Norway and Sweden cooperate with us in this work. Italy also expressed an interest to participate in this work and made a good progress in the negotiation process. In April we conducted a meeting of the Russian-Italian Committee and according to it's decision the first contracts on execution of works related to this project should be signed early before this summer.

The fourth large project is construction of specialised facilities for interim SNF storage, for it's management, and for management of radioactive waste and remediation of the base in Gremikha, located also at the North-West of Russia. Financing of these activities is coming from France, from the Northern Dimension through the European Bank of Reconstruction and Development and from the European Commission. For such sites as Andreeva Bay and Gremikha, where more than one international partner is involved, we introduced a system for coordinating the activities through establishing international coordinating working groups. They proved to be effective. In the first case a UK representative is leading the group, and in the second case, France is a leader. The experience is really positive, and we hope to expand it also on the other projects.

The fifth important direction is construction of the long-term storage of icebreakers SNF in Murmansk. This project is being funded by the UK. Even the icebreakers do not belong to the NPS family, one should not forget that the Global Partnership Programme in it's full title is a Global partnership against spread of weapons and materials of mass destruction. Therefore, when speaking about icebreaker's SNF we should understand that in reality this is the same submarine's SNF and it also could be used by terrorists in their criminal intentions. Therefore we must secure it and store safely with the same care as for NPS fuel. These are the reasons why this project is also of high priority.

- How many NPS have been dismantled by now and how many are still to be dismantled?

S.V.Antipov: At the moment the situation is the following: In total 197 NPS have been withdrawn from operation by now, and 133 submarines out of this number have been dismantled. 26 submarines are in the dismantlement process and 38 submarines wait their dismantlement. This is how the numbers are distributed between the regions:

	Total	North-West	Far East
Number of NPS withdrawn from operation	197	120	77
Number of dismantled NPS	133	90	43
Number of NPS at the dismantlement stage	26	13	13
Number of NPS waiting dismantlement	38	17	21
Number of NPS with SNF in their reactors	49	24	25

Please note the difference in the pace of activities in the North-Western Region (Northern Fleet) and the Far-Eastern Region (Pacific Fleet). While at the North 120 NPS were retired from the Navy sometime ago, at the Far East this number corresponds to 77 NPS only, i.e.

almost twice less. But now the numbers of NPS to be dismantled in these regions are almost the same: 17 NPS at the North and 21 NPS – at the East. The ratio turned around. This shows the fact that at the North the dismantlement process is progressing very fast, and at the East it is much slowly. This causes an alarm that at Kamchatka we might not finish in time. The reason is that many donors help us at the North-West (several European countries and Canada), but at the East it is only Japan that provides us very limited assistance. Australia also expressed its intention and transferred part of the money to the address of the Russian-Japanese Committee, however we are still not able to use these money. We urge all donors to consider this situation very attentively and at the extend possible to pay attention and to provide help to the activities at the Far East and especially at Kamchatka. Even geographically it would be very expedient and natural if Canada and USA provide this assistance since they are located closer than the others. And speaking about the potential hazard, they should be interested in the problem more that the other countries.

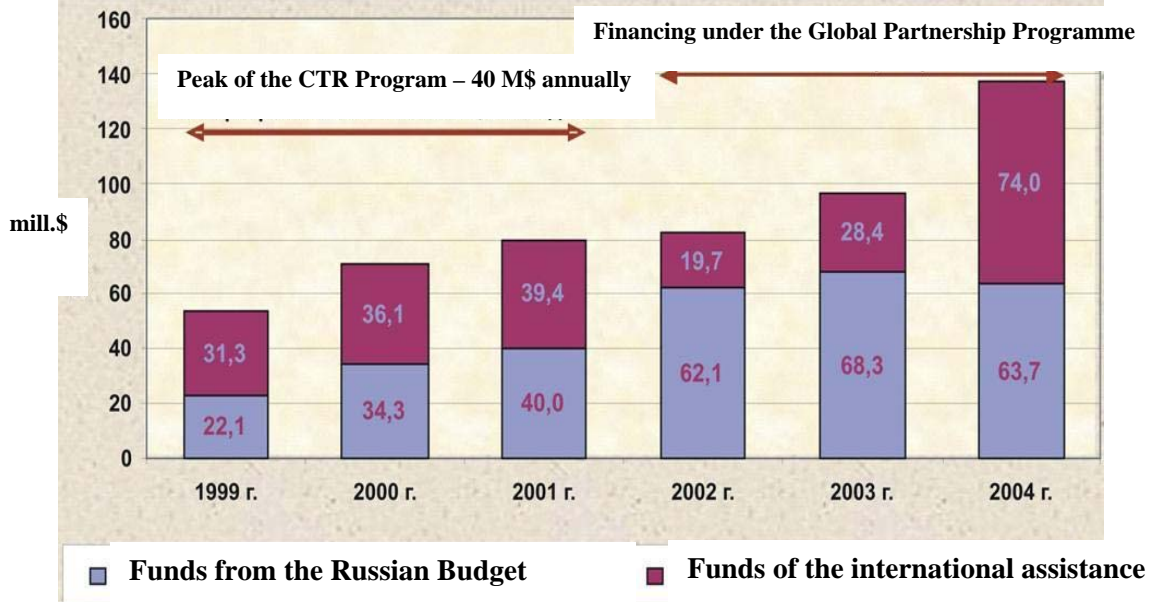
- And what is the input of each of the foreign partners to the NPS dismantlement? What is the ratio between the number of submarines dismantled with the foreign assistance and the number of subs that was dismantled under the Russian budget?

S.V.Antipov: Number of submarines dismantled with assistance of each country involved is given in the following table:

Donor	Dismantled	In the dismantlement process	Promised additional assistance
USA	7	2	2
Canada	3	4	5
United Kingdom	2	1	1
Japan (+Australia)	1	-	5
Italy	-	-	3
Norway	2	1	2

In general the situation is the following: Out of 38 NPS that we have to dismantle, foreign partners are ready to help for 18 NPS. As I mentioned already, total number of the dismantled NPS is 133. About 30 subs out of this number – under foreign funding. All other NPS were dismantled exclusively under the Russian money. Ratio between the Russian and the foreign financial input to the NPS dismantlement activities both within the frame of the Global Partnership and in the frames of other programmes is given in the following diagram:

Financing activities on comprehensive NPS dismantlement from the Russian funding and under the international assistance



- What are the results of the last year of 2005?

S.V. Antipov: Summing up the results I'd like to mention the major projects that are being implemented now in this area, and also the results other than the NPS dismantlement that have been reached. 19 NPS have been dismantled in 2005; 12 submarines were defuelled; 9.5 tonn of SNF were transported to Mayak enterprise for reprocessing. A unique operation on defuelling of the Alfa-class submarine with the lead metal cooled (LMC) reactor has been performed first time after a 20-years break. This is a different reactor technology, and a different submarines technology. To my regret we did not manage to conduct this operation during almost 20 years, because and the infrastructure for this operation at the only base in Russia in Gremikha was completely destroyed. We succeeded in re-establishing the infrastructure, made it operable, presented it to the regulatory authorities, and as a result this operation was executed. During this summer we plan to defuel one more LMC core.

During the last year we transferred 13 NPS from their previous location to the shipyards for dismantlement. After the tragedy of the sunken submarine K-159, this work draws a special attention, and taking this into consideration I must admit that it is not a simple numbers, but great efforts, a great responsibility. The completed work was successful and 13 NPS were transferred to the shipyards. Three nuclear service ships (NSS) were prepared for the long-term storage and awaiting the dismantlement. In other words, we completed the works that allow reliable waiting for the moment when the dismantlement is possible.

Besides, the following facilities have been finalized and commissioned: decontamination station in the Andreeva Bay site, dry dock for defuelling the Alfa-class submarines and for NSS maintenance, personnel changing room was commissioned in the Andreeva Bay, a special roofing was build above the SNF dry storage unit in the Andreeva Bay, a mobile radiation check-point was built in the Andreeva Bay to conduct the work there, a pad for

storing the reactor compartments before their shipment to the Sayda Bay facility has been built and commissioned at the Nerpa shipyard. Finally, an interim storage pad for SNF casks was built at the DalRAO enterprise at the Far East.

The work on the following projects continues: Sayda Bay and similar facility for storing reactor compartments at the Razboynik Bay at the Far East (this work is being conducted by Russia alone). We invite our partners, especially Japan, to take part in this work. A negotiation process is taking place, but we can not now report on the positive results. Design of the integrated complex for SNF management in Andreeva Bay is being developed now. As I mentioned already, this work is being conducted by a group of our donors, but actual design activities are being conducted by the Russian organization. Activities of the storage of the icebreaker's fuel continue, physical protection systems at Gremikha and at Andreeva Bay sites are being developed. Manufacturing of the buoyancy pontoons is nearly completed at the Nerpa shipyard; these pontoons are required for keeping NPS afloat or transfer NPS to a short distances from their location points to the shipyards for dismantlement.

- And how do you solve the problem of nuclear service ships (NSS) dismantlement?

S.V.Antipov: It is a fact that the problems of dismantlement of NSS and NPS are common. However now we confess the following principle: NPS should be dismantled in the first place, because they are closely related to SNF located inside them. And this is the major hazard. Nuclear service ships we transfer to the safe condition, prepare them to the long-term storage afloat until the time when we will be able to start their dismantlement. I believe that this will be possible only after 2010.

- Sergey Viktorovich, How do you think the experience of activities with NPS could influence further development of the nuclear industry?

S.V.Antipov: Speaking about safety of nuclear power in the light of the issue we are discussing – the NPS, it would be expedient to remind the following aspect. Now, when people speak about nuclear power, they usually keep in mind only nuclear power plants (NPP). In reality, when we speak about nuclear powered submarines, not many people consider that this is also nuclear power; (NPS) nuclear reactor produces the energy in a same way as the nuclear power unit.

It is interesting to compare conventional and propulsion reactors:

Parameters	Conventional nuclear power (NPP)	Propulsion nuclear power (NPS)
Nuclear of reactors (built)	36	> 450
Total thermal power, MWth	$\sim 10^5$	$\sim 5 \times 10^4$
Integral operational life, reactor-years	~ 400	~ 2000
Integral power production, MW*hr	$\sim 10^{13}$	$\sim 10^9$

As you can see, number of NPS reactors is 15 time more than the NPP's ones. One may say that NPP reactors are big, but submarine reactors are small. However, the difference between the integral thermal power of conventional and propulsion reactors is only factor of two, or using the mathematical terminology – the values of the same order of magnitude. But if we consider the integral operational experience, for conventional nuclear power it constitutes 400

reactor-years, but in the propulsion nuclear power it is 2000 reactor-years, i.e. five times more. Therefore, if we speak about reliability of reactor installations of different applications, we should consider that the experience of the propulsion nuclear installations in this respect is priceless, and of course everything that has been gained in this area could be transferred to the conventional power.

It is well known that our country now put forward quite extensive plans for development of nuclear power. This will be also discussed at the G8 Summit, that is to be held in July this year in St.Petersburg. We approach this Summit with strong position: within the frame of international cooperation we accomplished a huge scope of work, that I explained here above. There is plenty of work ahead of us, and we do not intend to slow down.

The discussion was held by Artem Buslaev. Minatom.ru