RUSSIA'S MILITARY

A MEDIUM TERM ESTIMATE

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Introduction

Ten years after the collapse of the Soviet Union, the Russian Federation has substantially reaffirmed its role of major power in the Euro Asiatic Continent.
The process of disbandment of Soviet vestiges has not been easy. After seven decades of totalitarian rule and centralised economy, the whole social and political architecture governing the largest country in the world was totally inadequate to manage the revolutionary process set in motion by the last Soviet leader, Michael Gorbachev.
As far as the international stature of the Soviet Union is concerned, this was largely determined by the huge dimension and capabilities of its armed forces.
For almost the entire period of communist rule, Soviet leaders spared no efforts in order to increase the power of Soviet military. The gigantic effort for creating the most comprehensive and redundant military machine of the modern age involved the total mobilisation of national resources, both human and technological ones.
The massive organisation of armed forces was fed by an equally enormous industrial complex, without any competitors in the world, as far as the output capacities were concerned.
Thanks to the mobilisation of the whole society, the Soviet Union enjoyed the status of super power and contended the world leadership to the United States in almost all the political and cultural arenas.
The same effort proved to be fatal for the survival of the communist system. Faced with the prospect of a never-ending competition with the capitalistic world, the system of planned economy finally imploded under the pressure of domestic quests for better standards of living and democracy and for the external pressure from the western powers, which spent huge amount of resources for containing and also weakening the Soviet power.
The end of the Cold War could coincide with the end of the Berlin separation, or perhaps with the start of a genuine dialogue between Soviet and American leaderships on the reduction of mutual threat of assured nuclear destruction.
But the beginning of the new era, as far as the military security in Europe is concerned, could be also easily linked to the establishment of a comprehensive security architecture made of disarmament treaties, a regime of mutual intrusive inspections and collateral measures of confidence building.
All this was achieved in few years, between 1987 and 1992. After forty-two years since the end of the Second World War and the division of Europe, in just five years the European strategic landscape was totally washed out and rewritten.
But the early nineties are historically fundamental also for the end of the Soviet Union as a very cohesive union among fifteen different republics.
Actually, the communist rule acted as unifying force in cultural and political terms, but the state apparatus of the security service was certainly dominant in the preservation of the central control over the very extended periphery of the Soviet empire.

Along with the ubiquitous KGB, the military organisation also played a very important role in the domestic affairs, although military top leaders never acceded to the first echelon of political apparatus, more often than not being perceived as a potential threat to the civilian leadership.
It is not by chance that in the final act of the de-sovietisation, when a failed coup-de-etat overthrown Gorbachev from the leadership but favoured a much stronger and anti-communist contender, Boris Elstin, the military resulted decisive exactly because incapable of making a hard political decision, either in favour or against the return to the previous regime.

Since then, and for the next ten years, Soviet Union and the independent states generated from its collapse lived a steady decrease in their economic, political and military status.
Many analysis have been devoted to the study of the economic transition from the planned economy to the market; actually, most of these studies had to assess the failures of the several "models" for the transition, quickly imported from the capitalistic world but equally quickly abandoned for their social impact on a much impoverished and morally frustrated population.
The transition of the military apparatus from its pivotal status in Soviet society and politics to the much modest prominence expected in the post-communist era also attracted the attention of several analysts.
But these analysis were much more of sociologic rather than of strategic nature.
Former-soviet soldiers suffered a lot for the appalling conditions caused by the dramatic crumple of post-soviet economies. This caused also some concern as far as the security of nuclear, biological and chemical weapons is concerned, because of the fear that some hungry and demoralised soldier could eventually disregard their duties and perhaps sell the weapons to criminal or terrorist organisations.
In terms of pure military relevance, the interest for the status of post-soviet armies was negligible. This, for the combined effects of the aforementioned impressive changes that took place in just few years.
In the context of such impoverished economies and with less-than consistent political leaderships, the armed forces of the post-soviet states posed no credible threat other than the risk generated by the spread of strategic weapons or materials. Therefore, the West engaged Russia and the other post-soviet states which inherited strategic weapons with assistance programs aimed at reducing this kind of risks. Until the G-8 summit in Kananaskis, Canada, the genuine worry of western countries was the lessening of this kind of risk, and huge amount of resources was devoted – or at least promised – for the dismantle of the WMD legacy.
In addition to this, the existing comprehensive security architecture established in Europe offered a sound assurance against the risk of conventional or nuclear war.
Actually, the ceilings established under the CFE treaty were no longer relevant because the reduction of Russian and post-soviet militaries largely exceeded those imposed by the international agreements. Also, the readiness of those armed forces was estimated as really low, thus the actual effectiveness of the weapon systems on hold was, again, estimated as negligible.
Just like the Cold War mentality survived several years after the early summits between Reagan and Gorbachev, this phase of "strategic vacancy" pervaded western perceptions until very recently.
All the post-soviet countries, other than Russia, seemed to experience such a diminution of their military might that even a non-democratic pattern of domestic evolution could not cause any significant concern.

As for Russia, the very existence of a relatively stable power, able to control at least its own territory, was perceived as a stabilising element, also due to the concurrent crisis in the Balkans that clearly showed the risks associated with the fragmentation of multi-ethnic states.
Therefore, the first war in Chechnya provided the confirmation of the very bad state of Russian military, while the anxiety were mostly associated with the risk of further extension of violent confrontation outside the Caucasus region.
The second Chechen war provoked more reactions, but basically from the anti-war and humanitarian organisation, rather than from western leaderships, at that time very much involved in the Kosovo crisis.
A significant change in western attitude toward Russia, with some sort of restoration of the interest for its military might, has finally come in recent years.
The aggressive rhetoric used by Putin has been accompanied by the execution of Cold War-style military manoeuvres with strategic bombers over-flying artic regions, apparently bound for North American or Northern European countries.
At the same time, the harsh confrontation over the US plans for a anti-ballistic system to be based in Europe has led to the suspension of Russian compliance with the CFE Treaty. This latest event has been associated also to the non-ratification of the adapted Treaty by NATO countries, which blame Russia for not having completed the total withdrawal of its troops from the former-Soviet countries.
Moscow has openly rejected NATO's accusation, while defining the establishment of US bases in former Warsaw-Pact counties a violation of the political agreements of the early nineties.
In short, in the last few years the whole security architecture established at the end of the Cold War has been questioned.
Therefore, Russian military could be again a matter of concern for the military security of western world.

The economic outlook of Russia seem much more promising today, with the international oil prices nearing the 100 dollars per barrel.
Moscow has early repaid its foreign debt, and has accumulated a huge reserve in hard currency, whose exact dimension is still unaccounted.
In the really competitive market of international sales of major weapon systems, Russia has obtained brilliant successes, delivering huge quantities of advanced weapons to first-class customers like India and China.
The late-soviet technology has been therefore re-evaluated as substantially more advanced than originally perceived. Russia's ability to further improve the late-soviet weapon systems has assured the country the second largest income of foreign currency, after the export of oil and gas.
In addition to this, the improved outlook of financial resources and the stated will to substantially increase military expenditure, beyond the already increased levels of the last three years, could provide Russian military industry with the much waited inflow of money required for a decisive modernisation of its production.
Moscow is now developing a new generation of weapon systems, both of tactical and strategic relevance. The technical details of this new generation remains sketchy, as well the Russian ability to complete the development in a timely manner, and to shift to produce adequate numbers of the new systems.
It seems therefore almost impossible to predict the capabilities of Russian armed forces in the long period, that is more than ten years from now.

Too many variables should be accounted for, and such a prediction would be largely based on political or perhaps cultural prejudices, rather than technical assessments.
Instead, a short-medium term analysis seems within our capabilities, because most of the organisation and technological heritage of the present armed forces will constitute the basis for the Russian military of the next decade.
Nevertheless, important changes could arise due to the expanded amount of military expenditure, the maturity of new technologies now under trial and – perhaps even more important – the politico-military response of western countries to the new assertiveness of Russian leaders.

The present survey aims to provide a general but accurate outlook of the present reality of Russia's military.
The authors have selected the most relevant topics to be investigated, in order to reduce the research of data and the analytical outcome to a bearable level.
As for the analysis of equipment of Russian armed forces, the survey has investigated the present holdings of land-warfare weapon systems, the composition of the Fleet, the holdings and technical characteristics of major aircraft and the composition of the strategic arsenal.
Each of these component has been analysed with a peculiar criterion.

Land-warfare equipments have been divided following the year of in-service date, and again following the year of end of production.
The first breakdown provides a rough indication of the present composition of Army stocks of major weapon systems, as far as their age is concerned. Obviously, the bare number of years elapsed from the original introduction in service could be misleading, if directly translated as the general level of capabilities.
Nonetheless, such index provides a very useful synthesis of the "composition by generation" of the present Russian Army. It offers an immediate outlook on how old is the stock of equipment.
The second breakdown offers a rough indication of the level of obsolescence, reliability and availability of Army's inventories. Those systems which are still in production – perhaps for the export market – and those which still enjoys major programs of modernisation are likely to offer higher levels of availability and reliability, and perhaps a lower level of obsolescence.

The Navy's major vessels have been analysed one-by-one, from their laid-down and through their service life. The purpose was to deduce the expected lifespan for each class of vessels, and a rough indication of their level of obsolescence.
Such analysis has been synthesised in a graphic depiction, able to provide an immediate outlook of the present composition of Russian Navy and its expected composition in the next decades.

Air Force inventories have been evaluated both in terms of age of the fleet and technological level of the most-advanced aircraft. To some extent, the analysis of Air Force followed the "composition by generation" criterion used for the land-warfare equipment, but was followed by the analysis of the ongoing modernisation plans, focusing the attention to the next-generation fighter aircraft, as a benchmark of the Russian capabilities in the third-dimension weaponry.
The purpose – again – was to provide a synthetic but effective picture of the present capabilities of Russian Air Force and the expected situation five-to-ten years from now.

The strategic weapon systems have been analysed in accordance with the composition of the existing arsenal and their expected service life. The outcome of this analysis is a graphic depiction rather similar to that of the Navy.

But in order to make a credible hypothesis of the composition and level of effectiveness of Russia's armed forces in five-to-ten years, a further element of analysis has been taken into consideration.
Russia's economy has been analysed in its main macroeconomic figures, in order to assess the trends in Gross-Domestic Product, level of external debt, domestic (government) expenditure, defence expenditure etc.
Also, a critical microeconomic figure has been tracked, the consumer-prices index.
The purpose was to evaluate the expectable level of defence expenditure in the medium term, in accordance with a stable-growing economy, or in the presence of improved or declining economic performances.
These three hypothesis of future defence expenditure form the basis for the estimate of Russia's military capabilities in the five-to-ten years period.

Beside this hardware-centric survey and analysis, the present research greatly enjoyed the theoretical sustain of the parallel research, carried-on by the Conflict Studies Research Centre, UK Defence Academy.
CSRC's researchers focused their attention on the human factor of the present and future Russia's military.
The critical aspects of recruitment and doctrine have been deeply analysed.
Taken together, CeMiSS and CSRC researches are bound to provide a sound support for any practitioner or decision-maker eager to better understand the present state of Russia's military and the expected changes in the medium term.

Land Forces

Organization Structure and Equipment

Russian armed forces' land components are still strongly influenced by both the Soviet model and the heavy crisis in morale, training, logistics and procurement occurred during the 1990s. The conflicts in Chechnya and in the former-Soviet republics showed heavy shortfalls not so much in weaponry, though they were increasingly obsolescent; rather, decisive in their scarce efficiency was the poor availability of advanced artillery and anti-tank missile fire-control systems, command and control and technical control of artillery systems as well as night-vision, navigation and satellite positioning devices.

At a more general level, the equipments which Russian armed forces' land components continue to be equipped with are multiple rocket launchers and conventional artillery, as well as main battle tanks. While their situation is still moderately satisfying both from a quantitative and qualitative point of view, infantry personal equipments, reconnaissance systems, artillery rockets and ballistic missile systems as well as the helicopter assets are in critical conditions.

For this reason, upgrading projects are focusing on the following philosophy:

- upgrading of existing hardware;
- improvement of maintenance/repair capabilities;
- slow introduction into service of the best products of national defence industry;
- improvement of personal and team equipments, often conceived for urban or mountain usage;
- greater importance given for new equipments to mobility, air deployability, technical and strategic reconnaissance, command and control, precision engagement (above all for multiple rocket launchers and conventional artillery).

Legend and Methodology

In order to examine in detail the abovementioned situation we employed diagrams and tables, with the following conceptual criterion:

- Type: model of a weapon system according to its best-known designation;
- Role: main role of the weapon system, irrespective of any possible specialized variant;
- Quantity: total amount of the weapon system presumably owned, including stored – "in mothballs" – models, or models with a reduced usability (which either are employed exclusively for training or are worn-out by use and by obsolescence);
- In service: total amount of the weapon system actually in service, namely that has been distributed to the units and considered "combat ready";
- Year of start production: year in which the weapon system began to be produced. This element reflects the degree of obsolescence of a weapon system design, which can only partially slowed down by a project of refitting;
- Year of end production: year in which the weapon system ceased to be produced. This element reflects the degree of obsolescence of a weapon system's lifespan, starting from the assumption (though not always true) that the tendency is to maintain in service the latest-production systems rather than the oldest ones. With regard to this parameter, the following variables can also be traced (we will always refer to the production for domestic market, never to exportation):

- In Production/no production rate: Production is still existing (maybe, though not necessarily, for exportation needs) but without any annual production rate (or with a very low rate, between 1 and 5 items) for domestic market. Production line can still be used for maintenance/upgrading services, so full production could be resumed if necessary;
- In production for maintenance/upgrading services: Production is still existing, but only for overhaul services. It is not sure that full production can be resumed, if it would be necessary;
- In production/low production rate: Production is still existing, but works much more slowly than it could;
- In production: Production functions at a full speed.

Quality of personal and team equipments

Following the poor performances during the war in Chechnya or the attack to a Moscow's theatre in 2002, massive investments have been made to improve the quality of personal equipment, and allow Russian soldiers to face asymmetrical threats and/or act in urban areas[1]. Though qualitative conditions of personal and team weapons are satisfactory for the moment, there are other factors that strongly undermine the capabilities of Russian soldiers and infantry teams. Firstly, there is the scarce use of global positioning systems, night-vision devices and laser fire-control systems, which only recently the units deployed in Chechnya and Tajikistan have begun to be equipped with in sufficient quantities. Then, there is the problem of flack jackets: little known in the Soviet Union until the war in Afghanistan in the 1980s, recent models now present some of the features of the jackets used during that conflict, showing the same inadequacies. Indeed, Russian flack jackets can weigh up to 30 Kg, with great damage to troop mobility and ammunition-carrying capacity. Similarly, the helmets are too heavy and with low anti-ballistic protection capacity, and they are unfit to carry personal radio systems. As to the rest of Russian outfits, seldom they are waterproof or made in Gore-Tex fabric.

The equipment for the manoeuvre warfare

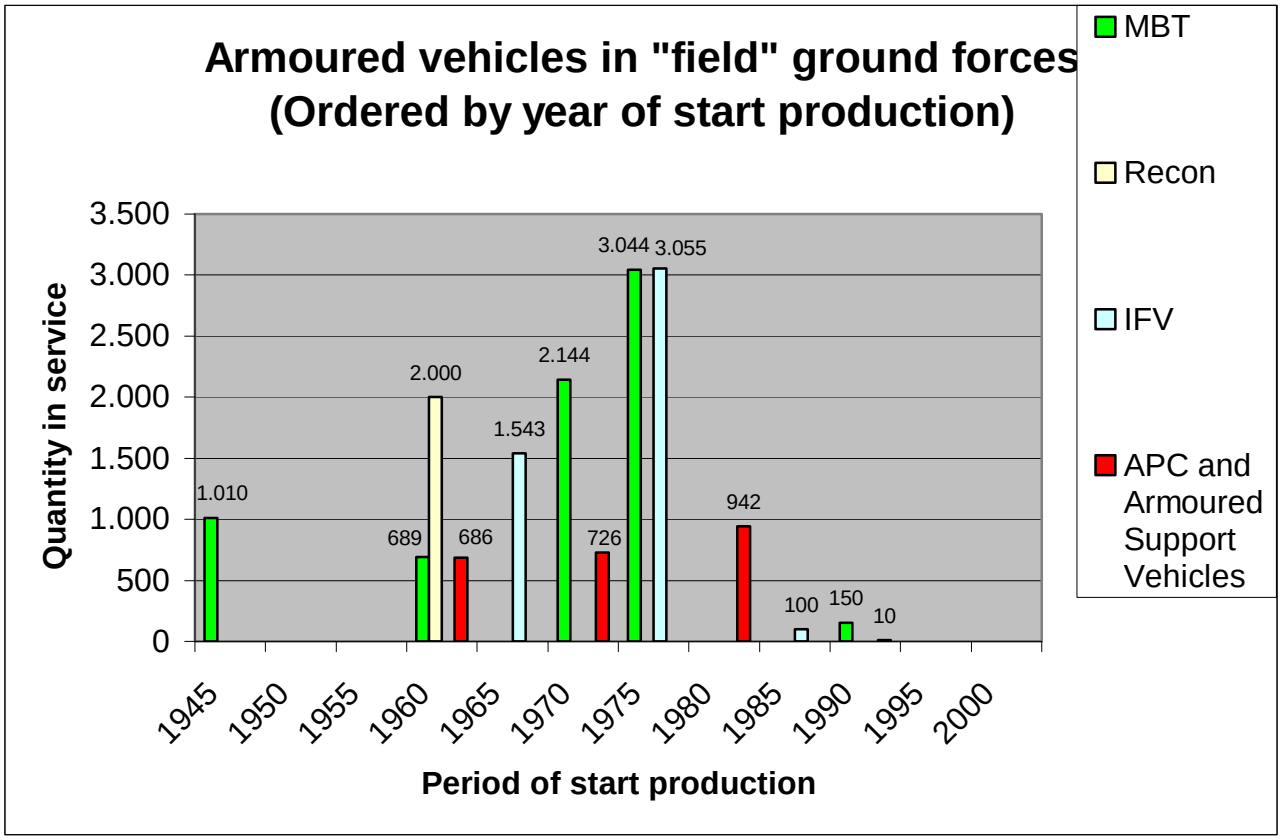
In 2004 the first T-90 main battle tanks began to be delivered. From its armour, IMR and BAT combat engineer vehicles have been developed, which are advanced enough to meet the needs of mechanized warfare. However, Robot-3 demonstrates that their substitute is already at experimental stage, which is conceived to revolutionize the sector of armoured support vehicles. With regard to Infantry Fighting Vehicles (IFV), while there are some upgraded models (first of all the BMP-3), most of the models in service are obsolescent or out-of-date

[1] Indeed, "In 2003, the MoD received an additional RUB500 million (USD15.77 million) to spend on anti-terrorist training and equipment; in 2004, this figure almost doubled. 2005-2006 procurement plans have a sharp counter-insurgency focus, with more money spent on upgrading air assets used widely in Chechnya and on small arms and personal equipment for special and rapid reaction forces", in: Jane's Sentinel Security Assessment - Russia And The CIS, 2007, *Russian Federation, Armed Forces*, 25-Jul. It should be noticed that during those events some shortcomings were identified in the activities of MVD (Ministry of Interior) and FSB (Federal Security Service) units. Relevant in relation to this study was the incompatibility between the units of these organizations and those of the Army, particularly in the field of respective communication and reconnaissance equipments, which strongly undermined the overall interoperability.

at all, and a slow plan of upgrading to improve their survivability is now under way. For the moment, there are only some prototypes of the Heavy Infantry Fighting Vehicles developed from T-55 and T-72 tanks, and probably there is no production. The situation of the armoured vehicles with which manoeuvre warfare units are equipped is the following[2]:

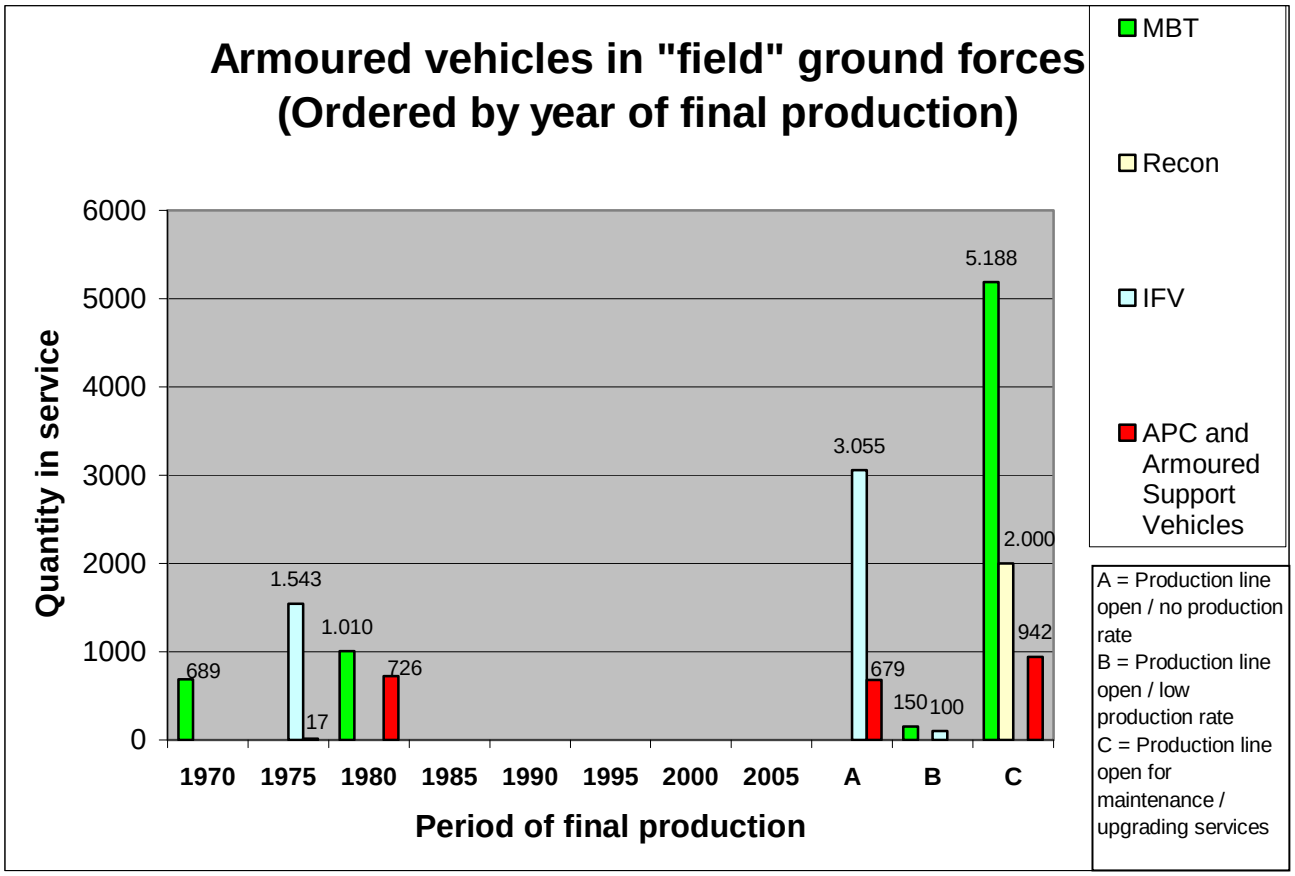
Type	Role	Quantity	In Service	Year of start production	Year of end production
T-54/55	Main Battle Tank	2,000	1,010	1947	1981
T-62	Main Battle Tank	7,000	689	1961	1975
T-72	Main Battle Tank	9,144	2,144	1974	Production line is still open only for maintenance/upgrading services
T-80	Main Battle Tank	4,500	3,044	1976	Production line is still open only for maintenance/upgrading services
T-90	Main Battle Tank	241	150	1994	Low production rate
BRDM-2	Reconnaissance Vehicle	6,000	2,000	Early 60's	Production line is still open only for maintenance/upgrading services
BMP-1	Infantry Fighting Vehicle	9,057	1,543	1966	Production probably ended around the late 70's
BMP-2	Infantry Fighting Vehicle	4,600	3,055	Late 70's	Production probably ended around the late 80's, but production facilities still remain
BMP-3	Infantry Fighting Vehicle	190	100	1990	Low production rate
BTR-60	Armoured Personnel Carrier	17	17	1960	1976
BTR-70	Armoured Personnel Carrier	726	726	1972	Production probably ended around the early 80's
BTR-80	Armoured Personnel Carrier	942	942	1984	Production line is still open only for maintenance/upgrading services
BTR-90	Armoured Personal Carrier	10	10	1994	Production line is still open but probably there is no real production rate
MT-LB	Armoured Support Vehicle	3,300	669	Early 60's	Production probably ended in the late 80's and, since today there are no production lines in Russia (only Ukraine and Bulgaria have them), there are plans for establishing a repair facility

[2] The data have been drawn by Jane's Sentinel Security Assessment - Russia And The CIS, 2007, *Russian Federation, Army*, 24-May, www.janes.com; IISS, 2007, *The Military Balance*, Rutledge, Abingdon; Yanko Eugene, 2007, *Russian Arms 2007*, Edition X3 April, www.warfare.ru.



As shown above:

- out of 7,037 MBTs, 14.35 percent were designed in the late 1940s, 9.79 percent in the first 1960s, 30.46 percent in the first 1970s, 43.25 percent in the late 1970s, and 2.13 percent in the first 1990s;
- out of 2,000 Recon Vehicles, 100 percent were designed in the first 1960s;
- out of 4,698 IFVs, 32.84 percent were designed in the late 1960s, 65.02 percent in the late 1970s, and 2.12 percent in the late 1980s;
- out of 2,364 APC and Armoured Support Vehicles, 29.01 percent were designed in the first 1960s, 30.71 percent in the first 1970s, 39.84 percent in the late 1980s, and 0.42 percent in the first 1990s.



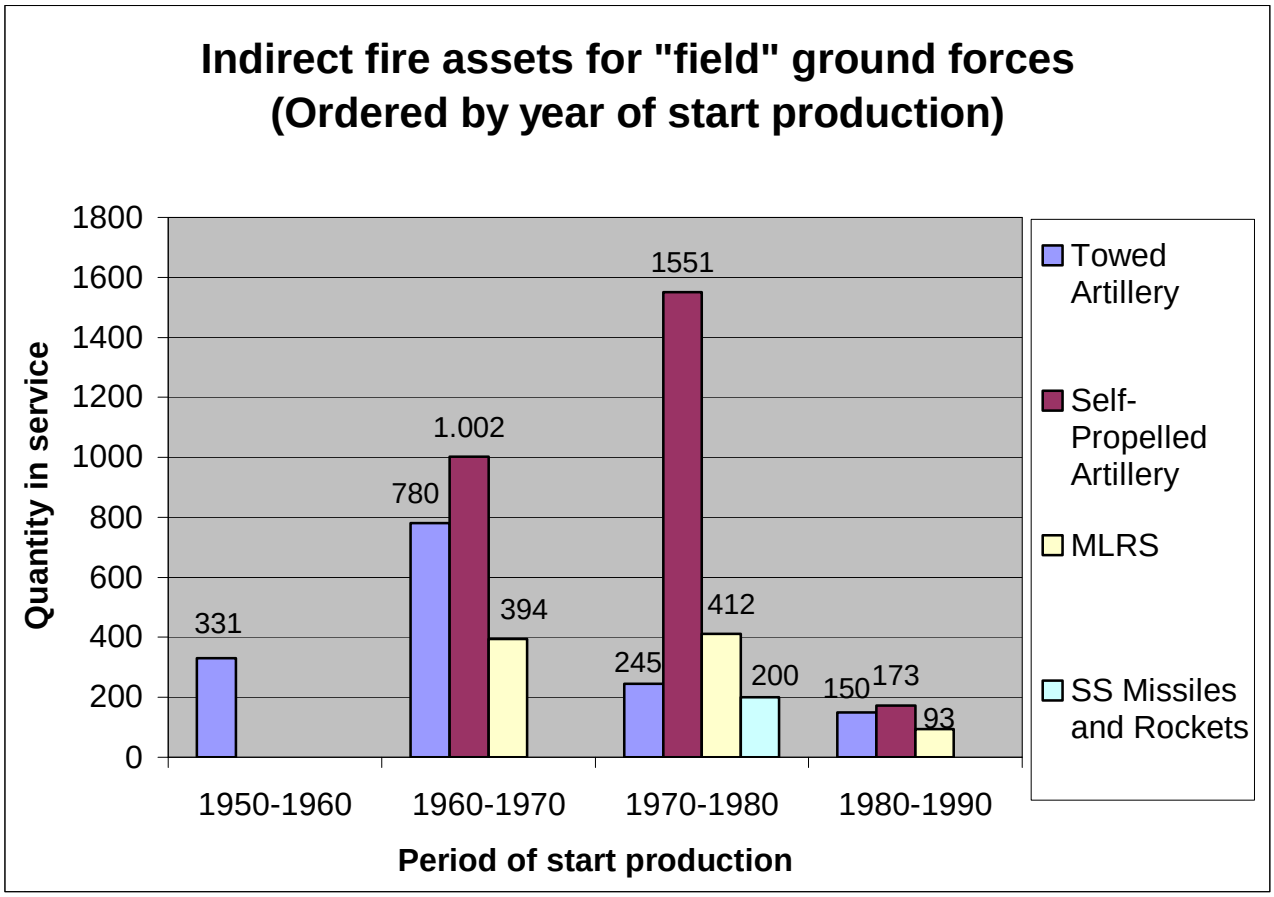
As shown above:

- out of 7,037 MBTs, 9.79 percent have a level of obsolescence dating back to the first 1970s, and 14.35 percent to the first 1980s; 2.13 percent are part of construction blocks still in production, but at a lower pace; and 73.72 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services;
- out of 2,000 Recon Vehicles, 100 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services;
- out of 4,698 IFVs, 32,84 percent have a level of obsolescence dating back to the late 1970s, 65.02 percent are part of construction blocks still in production (so, their obsolescence can be probably slowed down by the possibility of maintenance/upgrading service), though without any production rate; finally, 2.12 percent are part of construction blocks still in production, but at a lower pace;
- out of 2,364 APCs and Armoured Support Vehicles, 0.71 percent have a level of obsolescence dating back to the late 1970s, 30.71 percent to the first 1980s, 28.72 percent are part of construction blocks in production (so, their obsolescence can be probably slowed down by the possibility of maintenance/upgrading service), though without any production rate; finally, 39.84 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services.

The following is the situation of artillery and indirect fire sources[3]. With regard to self-propelled artillery and multiple rocket launchers, navigation and satellite targeting devices are being mounted (there are also several models of UAV for the discovery and the support to technical control):

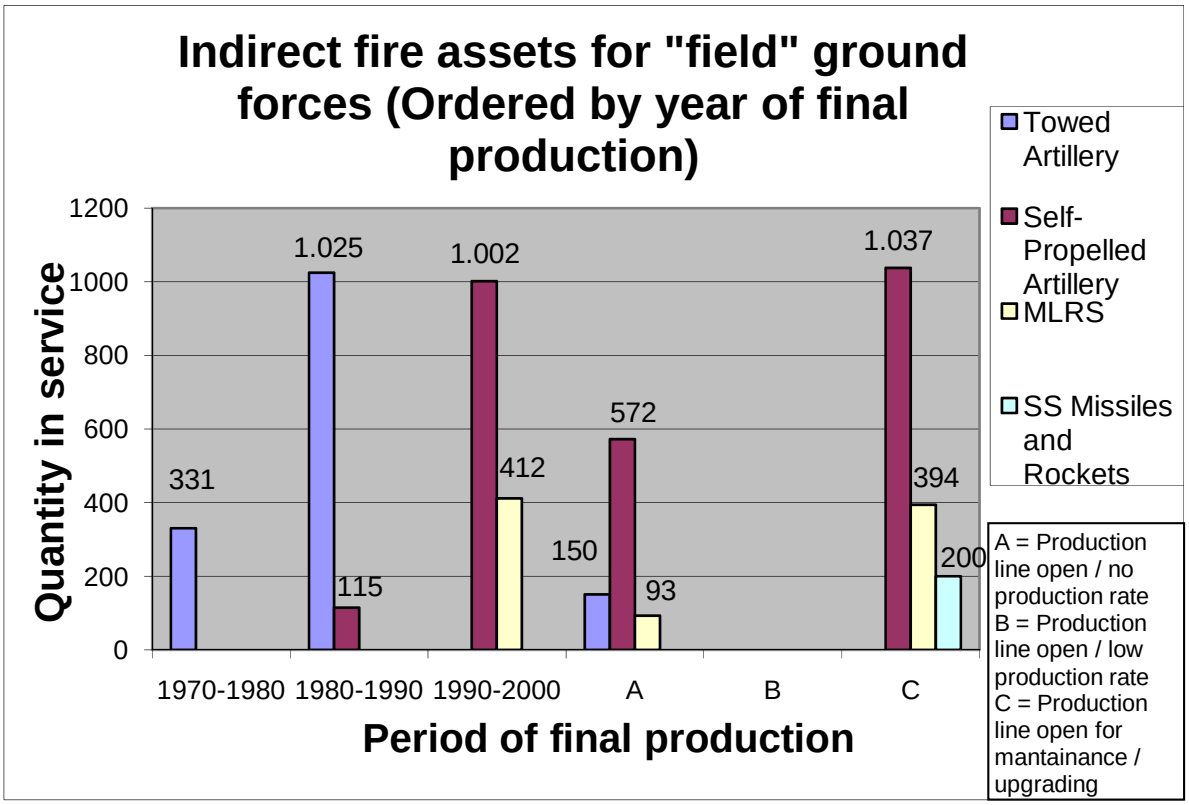
Type	Role	Quantity	In Service	Year of start production	Year of end production
152 mm D-20	Howitzer	1,075	281	1955	Probably in the late '70
152 mm 2A36	Howitzer	1,100	245	1976	In the late '80
152 mm 2A65	Howitzer	600	150	1987	Production line is still open but probably there is no real production rate
152 mm M-1943	Howitzer	700	Storage	1943	Probably in the early '50
130 mm M-46	Howitzer	650	50	1951	Probably in the early '70
122 mm D-30	Howitzer	3,800	780	1963	Probably in the early '80
122 mm M-30	Howitzer	1,213	Storage	1938	1955
240 mm 2S4	Self-Propelled Mortar	100	9	1975	Probably in the early '80. The laser-guided Smel'chak projectile should be still available
203 mm 2S7	Self-Propelled Howitzer	120	106	1975	Probably in the early '80
152 mm 2S3	Self-Propelled Howitzer	1,200	1,002	1970	Probably in the early '90
152 mm 2S5	Self-Propelled Howitzer	500	399	1976	Probably in the early '90. Production line is still open but probably there is no real production rate
152 mm 2S19	Self-Propelled Howitzer	220	173	1989	Production line is still open but probably there is no real production rate
122 mm 2S1	Self-Propelled Howitzer	1,400	1,037	1971	Production line is still open only for maintenance/upgrading services, also for some specialized versions (mineclearing, chemical reconnaissance, etc.)
300 mm BM-30	Multiple Rocket System	106	93	1987	Production line is still open but probably there is no real production rate
220 mm BM-27	Multiple Rocket System	492	412	1975	Probably in the early '90
122 mm BM-21	Multiple Rocket System	2,200	367	1963	Production line is still open only for maintenance and upgrading services to the last versions
122 mm 9P138	Multiple Rocket System	50	27	1963	Production line is still open only for maintenance and upgrading services to the last versions
FROG-7 (stored or in dismissal)	Surface-to-surface Rocket	1,000	Probably all of them stored	1965	Early '70
Tochka (SS-21) (in deployement)	Surface-to-surface Missile	350	200	1975	Production line is still open only for maintenance/upgrading services
R-17 (SS-1b/c) (stored or in dismissal)	Surface-to-surface Missile	500	Probably all of them stored	1962	In the late '70

[3] The data have been drawn from Jane's Sentinel Security Assessment - Russia And The CIS, 2007, *Russian Federation, Army*, 24-May, www.janes.com; IISS, 2007, *The Military Balance*, Rutledge, Abingdon; Yanko Eugene, 2007, *Russian Arms 2007*, Edition X3 April, www.warfare.ru; http://www.artillery-mz.com/.



As shown above:

- out of 1,506 Towed Artillery, 25.29 percent were designed in the 1950s, 51.79 percent in the 1960s, 16.26 percent in the 1970s, 9.96 percent in the 1980s;
- out of 2,726 Self-Propelled Artillery, 36.75 percent were designed in the 1960s, 56.89 percent in the 1970s, and 6.34 percent in the late 1980s;
- out of 899 MLRSs, 43.82 percent were designed in the 1960s, 45.82 percent in the 1970s, and 10.34 percent in the 1980s;
- out of 200 SS Missiles and Rockets, 100 percent were designed in the 1970s.



As shown from the Table:

- out of 1,506 Towed Artillery, 21.97 percent have a level of obsolescence dating back to 1970s, 68.06 percent to the 1980s, and 9.96 percent are part of construction blocks in production (so, their obsolescence can be probably slowed down by the possibility of maintenance/upgrading services), though without any rate of production;
- out of 2,726 Self-Propelled Artillery, 4.21 percent have a level of obsolescence dating back to the 1980s, 36.75 percent to the 1990s, 20.98 percent are part of construction blocks in production (so, their obsolescence can be probably slowed down by the possibility of maintenance/upgrading services), though without any production rate; finally, 38.04 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services;
- out of 899 MLRSs, 45.82 percent have a level of obsolescence dating back to 1990s, 10.34 percent are part of construction blocks in production (so, their obsolescence can be probably slowed down by the possibility of maintenance/upgrading services), though without any production rate; finally, 43,82 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services;
- out of 200 SS Missiles and Rockets, 100 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services.

The situation of anti-tank weapon systems (not personal nor team systems)[4] is the following:

[4] The data include the equipments supplied to Russian airborne forces, and have been drawn from Jane's Sentinel Security Assessment - Russia And The CIS, 2007, *Russian Federation, Army*, 24-May, www.janes.com; IISS,

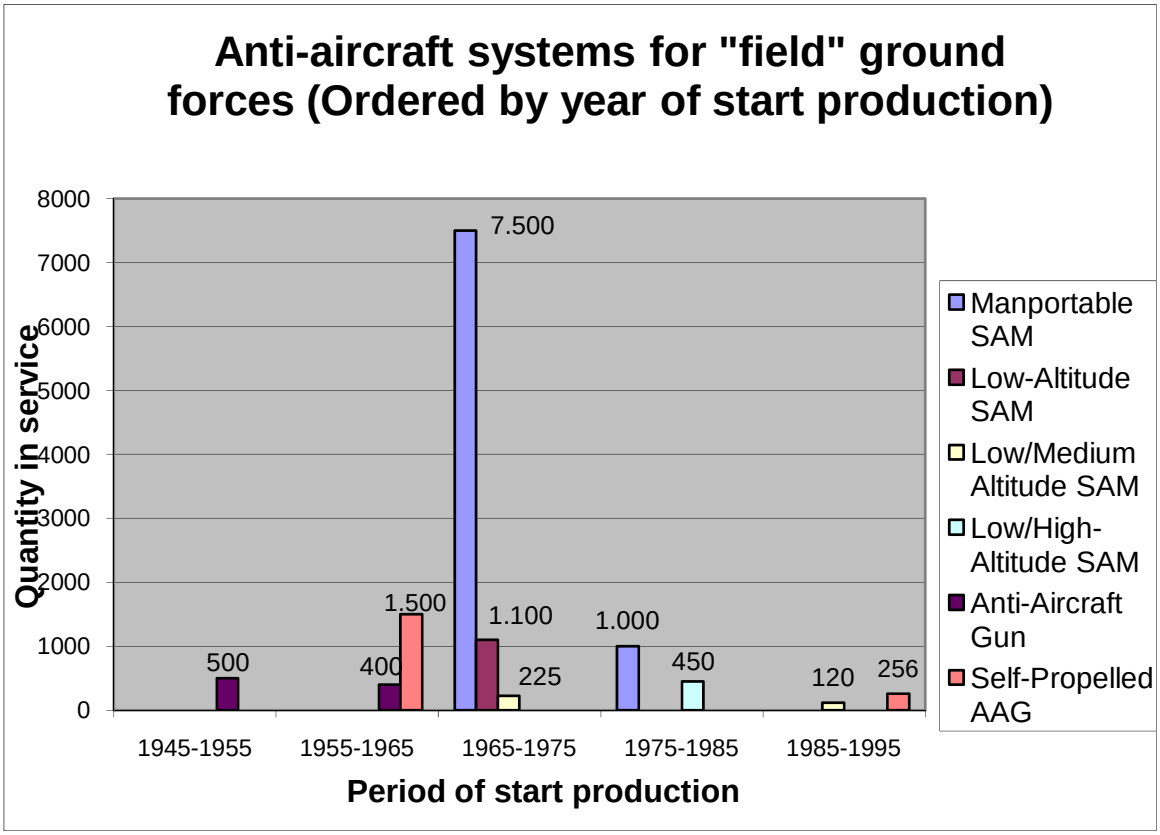
Type	Role	Quantity	In Service	Year of start production	Year of end production
9K11 (AT-3)	Anti-Tank Guided Weapon	?	?	1963	Production line is still open only for upgrading services
9K111 (AT-4)	Anti-Tank Guided Weapon	?	7,000	1973	In production
9P148 (AT-5)	Anti-Tank Guided Weapon	?	?	1975	Production line is still open only for production at request
9M114 (AT-6)	Anti-Tank Guided Weapon	?	?	1976	Production line is still open only for maintenance and upgrading services to the last versions
9K115 (AT-7)	Anti-Tank Guided Weapon	?	?	1978	In production
VIKHR (AT-9/AT-12)	Anti-Tank Guided Weapon	?	?	1985	Production line is still open only for production at request
9M117 (AT-10)	Anti-Tank Guided Weapon			1985	In production
100 mm MT-12	Anti-Tank Gun	?	526	1970	Probably in the '70

The situation of anti-air weapon systems the following[5]:

Type	Role	Quantity	In Service	Year of start production	Year of end production
Strela-2/2M (SA-7) (in replacement by SA-16 and SA-18)	Manportable SAM	5,000	5,000	1969	Production line is still open only for maintenance/upgrading services
Strela-3 (SA-14) (in replacement by SA-16 and SA-18)	Manportable SAM	2,500	2,500	1974	Production line is still open only for maintenance/upgrading services
Igla-1 (SA-16)	Manportable SAM	500	500	1983	In production
Igla (SA-18)	Manportable SAM	500	500	1983	In Production
SA-4A/B (probably all of them stored; in replacement by SA-11)	Low/Medium-Altitude SAM	220	?	1967	Probably in the early '80
2K12 (SA-6) (in replacement by SA-11 and SA-15)	Low/Medium-Altitude SAM	350	225	1968	1983
Antey Tor (SA-15)	Low/Medium-Altitude SAM	120	120	1988	Low production rate
Antey 9K33 (SA-8) (in replacement by SA-15)	Low-Altitude SAM	550	550	1974	Probably in the early '90
Strela-1 (SA-9)	Low-Altitude SAM	200	200	1968	Probably in the early '90
Buk (SA-11)	Low/High-Altitude SAM	350	250	1979	Low production rate
Antey S-300V/S-400 (SA-12A/B; SA-20)	Low/High-Altitude SAM	200	200	1983	Production line open, but no production rate
Strela-10 (SA-13)	Low-Altitude SAM	350	350	1975	Low production rate
85 mm D-44 and M1939 KS-12 (probably all of them stored)	Anti-Aircraft Gun	240	?	1945	Probably in the '50
57 mm S-60	Anti-Aircraft Gun	500	500	1950	1957
23 mm ZSU-23	Light Anti-Aircraft Gun	n/a	400	1962	Probably in the early '70
30 mm + 9M311/2S6 (SA-19) ZSU-30-2	Combined (SAM and guns) Self-Propelled AAG	256	256	1986	Low production rate
23 mm ZSU-23-4	Self-Propelled AAG	n/a	1,500	1965	1983

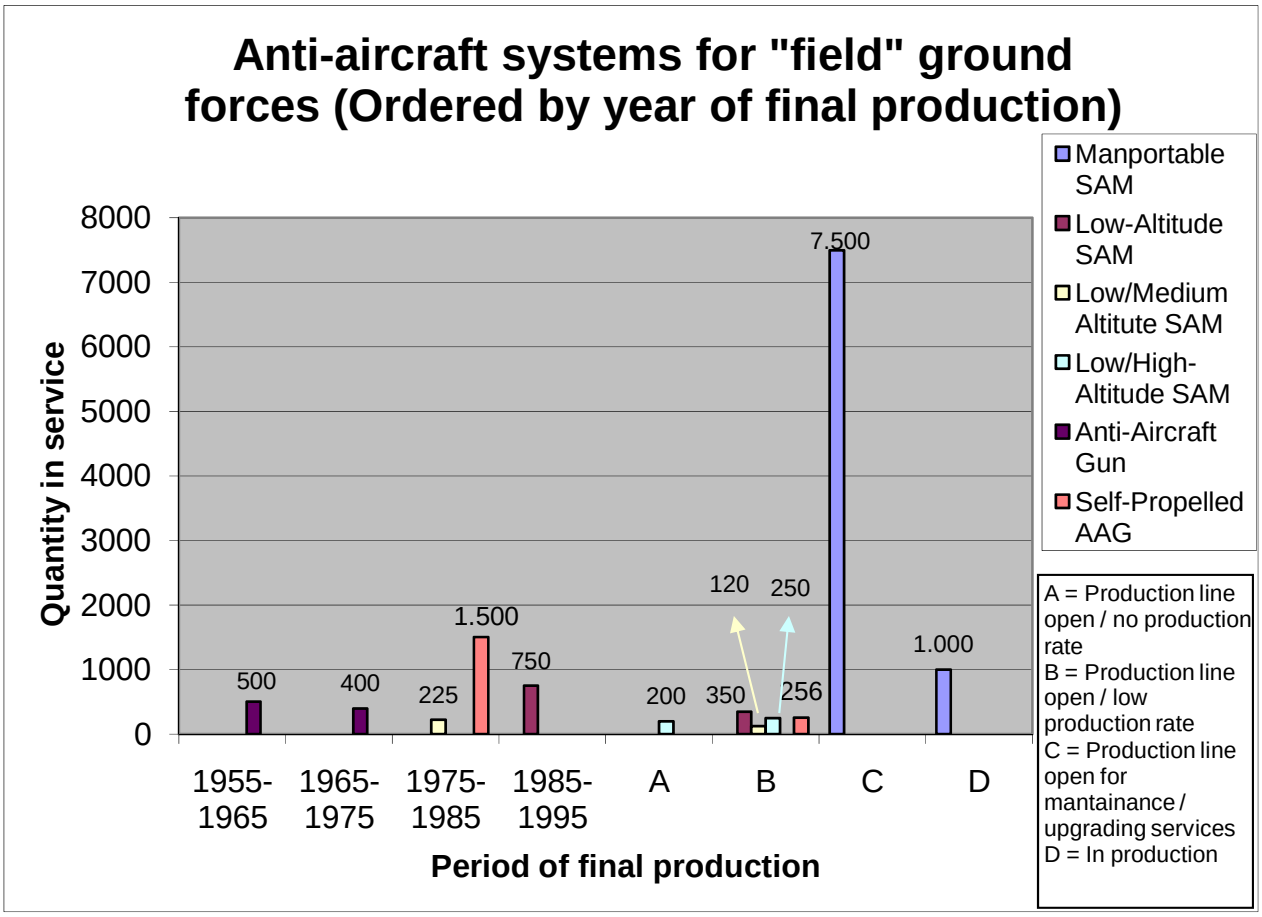
2007, *The Military Balance*, Rutledge, Abingdon; Yanko Eugene, 2007, *Russian Arms 2007*, Edition X3 April, www.warfare.ru.

[5] The data include equipments supplied to Russian airborne forces, and have been drawn from Jane's Sentinel Security Assessment - Russia And The CIS, 2007, *Russian Federation, Army*, 24-May, www.janes.com; IISS, 2007, *The Military Balance*, Rutledge, Abingdon; Yanko Eugene, 2007, *Russian Arms 2007*, Edition X3 April, www.warfare.ru.



As shown above:

- out of 8,500 Manpads, 88.23 percent were designed between 1945 and 1965, and 11.76 percent between 1975 and 1985;
- out of 1,100 Low Altitude SAMs, 100 percent were designed between 1965 and 1975;
- dei 345 Low/Medium Altitude SAMs, 65.21 percent were designed between 1965-1975, and 34.78 percent between 1985 and 1995;
- out of 450 Low/High Altitude SAMs, 100 percent were designed between 1975 and 1985;
- out of 900 Anti-Aircraft Guns, 55.55 percent were designed between 1945 and 1955, and 44.44 percent between 1955 and 1965;
- out of 1,756 Self-Propelled AAGs, 85.42 percent were designed between 1955 and 1965, and 14.57 percent between 1985 and 1995.



As shown above:

- out of 8,500 Manpads, 88.23 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services, and 11.76 percent are part of construction blocks that are still in production;
- out of 1,100 Low Altitude SAMs, 68.18 percent have a level of obsolescence dating back to the period 1985-1995, and 31.81 percent are part of construction blocks that are still in production, though at a lower pace;
- out of 345 Low/Medium Altitude SAMs, 65.21 percent have a level of obsolescence dating back to the period 1975-1985, and 34.78 percent are part of construction blocks that are still in production, though at a lower pace;
- out of 450 Low/High Altitude SAMs, 44.44 percent are part of construction blocks in production (so, their obsolescence can probably slowed down by the possibility of maintenance/upgrading services), though without any production rate, and 55.55 percent are part of construction blocks that are still in production, though at a lower pace;
- out of 900 Anti-Aircraft Guns, 55.55 percent have an obsolescence level dating back to the period 1955-1965, and 44.44 percent to the period 1965-1975;
- out of 1,756 Self-Propelled AAGs, 85.42 percent have a level of obsolescence dating back to the period 1975-1985, and 14.57 percent are part of construction blocks that are still in production, though at a lower pace.

With regard to the helicopter assets supporting land forces (since 2002 they have been transferred from Russian Army to Russian Air Force), most aircraft do not have all-weather capacity, except for the too few (and not so modern any more) Ka-50 and Mil Mi-28. Furthermore, there is a lack of precision ammunition (first of all the anti-tank one), because of failed procurements[6]. Most of the Mil Mi-24 (still an excellent project) have more than fifteen years of "hard" lifespan behind them, and many models are scarcely reliable. Their avionics is incompatible with the advanced precision ammunition that are in service, in course of acquisition or at a experimental stage. However, given the scarcity of financial resources for a substantial procurement of Ka-50, upgrading projects for the Mil Mi-24 are underway, through the instalment of satellite navigation systems, and laser fire-control and night-vision devices. The overall situation is the following[7]:

Type	Role	Quantity	In Service	Year of start production	Year of end production
KA-50	Attack	8	8	1989	Production line is still open but probably there is no real production rate
Mil Mi-28 (to be augmented by other few by 2010)	Attack	12	12	1990	Low production rate
Mil Mi-6	Transport	8	5	1958	1981
Mil Mi-8MT/P/Mil Mi-9/Mil Mi-17	Attack/Transport/ Airborne Communications	2,400	2,100	1967	Production line is still open but there is no real production rate
Mil Mi-24D/P/V/R (rapidly decreasing for maintenance problems)	Attack/reconnaissance	1,450	580	1972	Production line is still open only for maintenance/upgrading services
Mil Mi-26	Heavy Lift	35	25	1983	Low production rate

As we can see, the table clearly shows the fast obsolescence of the entire Russian helicopter fleet (irrespective of the role of each aircraft model), and the parallel minor replacement of materials. There is therefore no need to trace other diagrams on this topic.

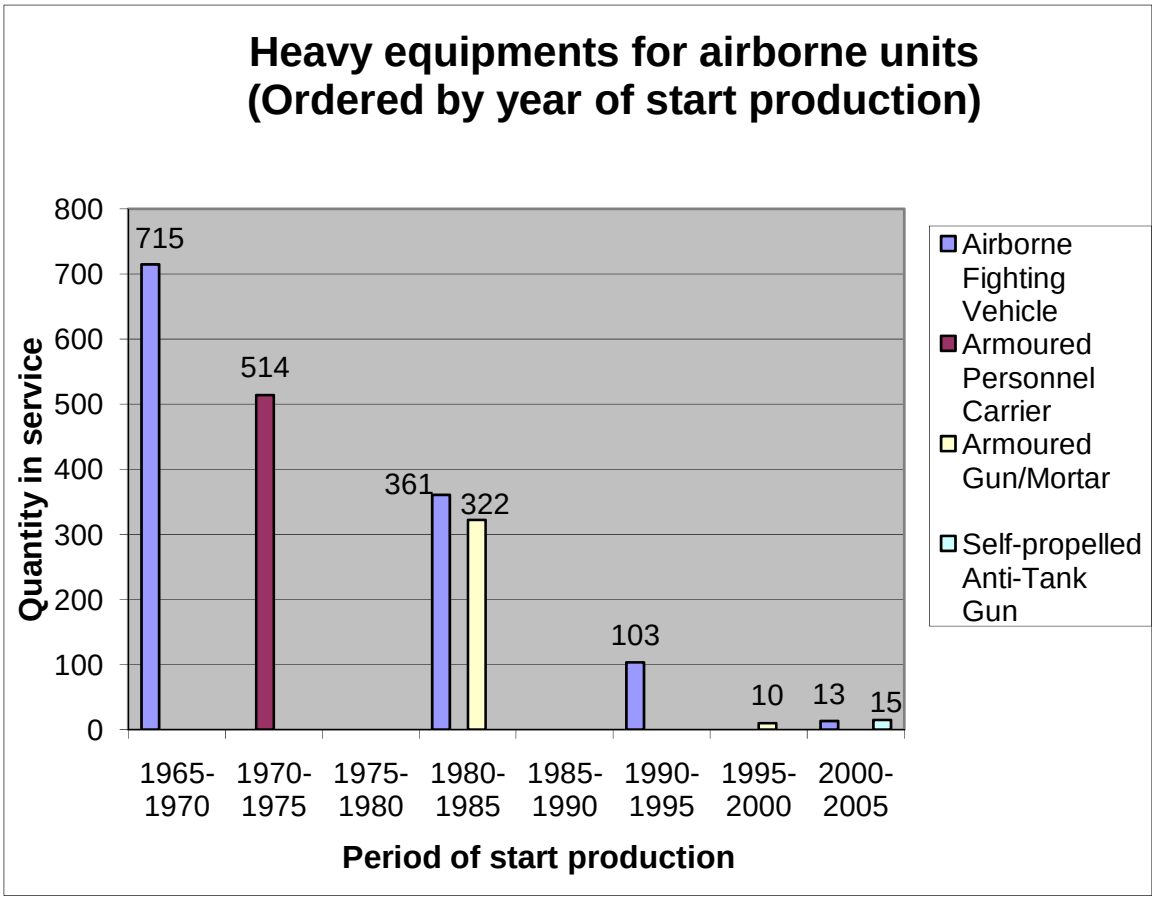
The equipments for Russian "mobile forces"

This group will include the forces tasked with strategic projection operations**,** according to Russian military doctrine: Airborne, Infantry and Navy forces, as well as the Spetznatz. Since the Soviet era these kinds of units have been supplied with better personal and team equipments than those supplied to conventional infantry, both for quality and quantity. This means that these units usually have enough positioning systems, night-vision and laser fire-control devices, advanced communication systems, portable UAV, etc. With regard to heavy equipments for the airborne units, the situation is the following[8]:

Type	Role	Quantity	In Service	Yaer of start	Year of end production

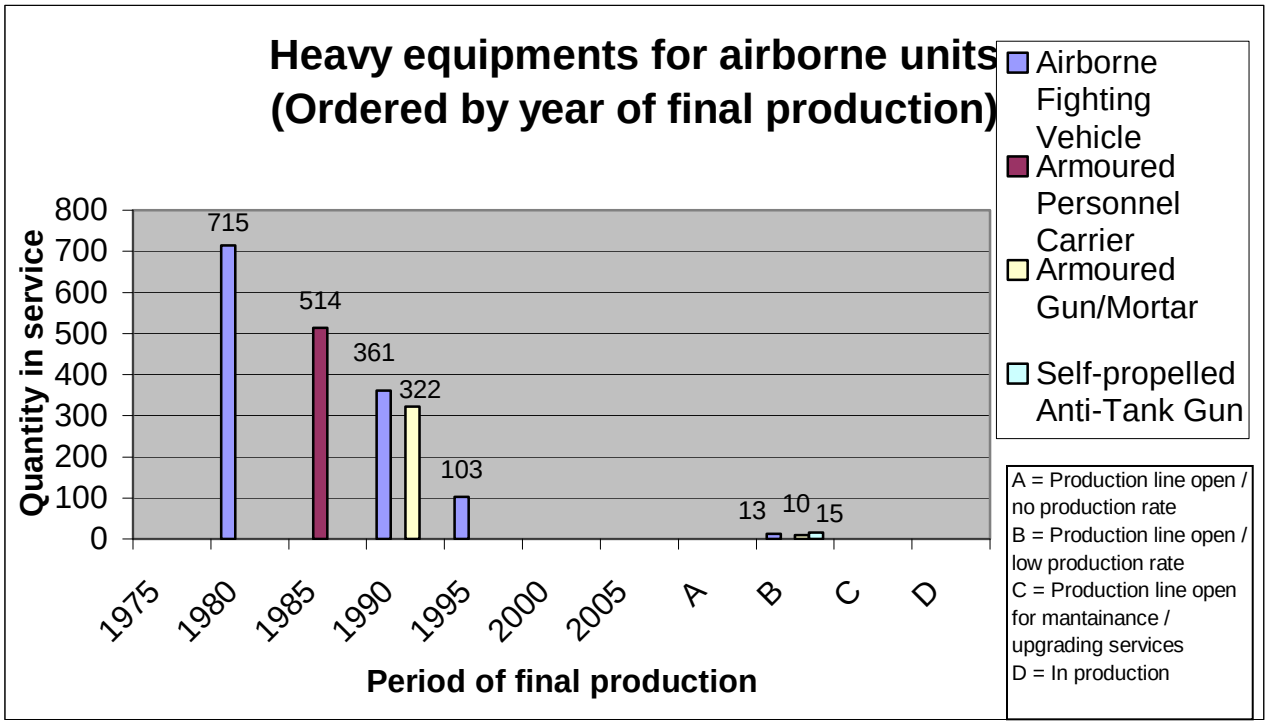
[6] See Jane's Sentinel Security Assessment - Russia And The CIS, 2007, *Russian Federation, Army*, 24-May.
[7] The data have been drawn from Jane's Sentinel Security Assessment - Russia And The CIS, 2007, *Russian Federation, Army*, 24-May, www.janes.com; IISS, 2007, *The Military Balance*, Rutledge, Abingdon; Yanko Eugene, 2007, *Russian Arms 2007*, Edition X3 April, www.warfare.ru.
[8] The data have been drawn from Jane's Sentinel Security Assessment - Russia And The CIS, 2007, *Russian Federation, Army*, 24-May; IISS, 2007, *The Military Balance*.

				production	
BMD-1	Airborne Fighting Vehicle	2,400	715	1969	Probably in the early '80
BMD-2	Airborne Fighting Vehicle	1,500	361	1984	Probably in the early '90
BMD-3	Airborne Fighting Vehicle	400	103	Probably in the early '90	Probably in the late '90
BMD-4	Airborne Fighting Vehicle	?	13	2005	Low rate production
BTR-D	Armoured Personal Carrier	700	514	1974	Probably in the late '80
120 mm 2S9	Armoured Gun/Mortar	600	322	1981	Probably in the early '90
120 mm 2S23	Armoured Gun/Mortar	30	10	1996	Low production rate
120 mm 2B16	Gun/Mortar	150	37	1986	Probably in the '90
125 mm 2S5	Self-propelled Anti-Tank Gun	15	15	2001	Low production rate
85 mm ASU-85 (probably none in active service)	Self-Propelled Anti-Tank Gun	400	?	1961	Probably in the late '60



As shown above, with regard to the Airborne units:

- out of 1,192 Airborne Fighting Vehicles, 59.98 percent were designed in the late 1960s, 30.28 percent in the first 1980s, 8.64 percent in the first 1990s, and 1.09 percent in the first 2000s;
- out of 514 Armoured Personnel Carriers, 100 percent were designed in the first 1970s;
- out of 332 Armoured Gun/Mortars, 96.98 percent were designed in the first 1980s, and 3.01 percent in the late 1990s;
- out of 15 Self-Propelled Anti-Tank Guns, 100 percent were designed in the first 2000s.



As shown above, with regard to the Airborne units:

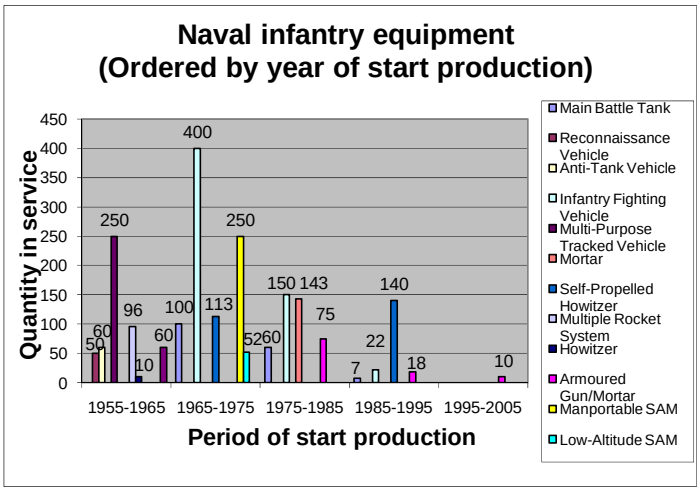
- out of 1,192 Airborne Fighting Vehicles, 59.98 percent have a level of obsolescence dating back to the first 1980s, 30.28 percent to the first 1990s, 8.64 percent to the late 1990s, and 1.09 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services;
- out of 514 Armoured Personnel Carriers, 100 percent have a level of obsolescence dating back to the late 1980s;
- out of 332 Armoured Gun/Mortars, 96.98 percent have a level of obsolescence dating back to the first 1990s, and 3.01 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services;
- out of 15 Self-Propelled Anti-Tank Guns, 100 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services.

This is the situation in relation to heavy equipments supplied to the Naval Infantry Units:[9]

Type	Role	Quantità	In Service	Year of start production	Year of end production
T-72	Main Battle Tank	100	100	1974	Production line is still open only for maintenance/upgrading services
T-80	Main Battle Tank	60	60	1976	Production line is still open only for maintenance/upgrading services
T-90	Main Battle Tank	7	7	1994	Low production rate

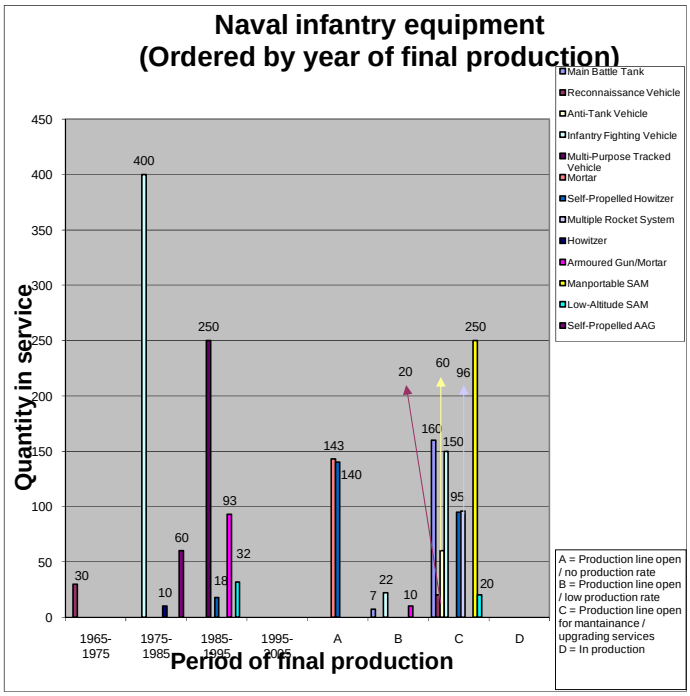
[9] Dati rinvenuti in: Jane's Sentinel Security Assessment - Russia And The CIS, 2007, *Russian Federation, Navy*, 5-Jul, www.janes.com; IISS, 2007, *The Military Balance*, Rutledge, Abingdon; Yanko Eugene, 2007, *Russian Arms 2007*, Edition X3 April, www.warfare.ru; http://www.artillery-mz.com/.

PT-76	Reconnaissance Vehicle	150	30	1958	1967
BRDM-2	Reconnaissance Vehicle	20	20	Early 60's	Production line is still open only for maintenance/upgrading services
BRDM-2 AT	Anti-Tank Vehicle	60	60	Early 60's	Production line is still open only for maintenance/upgrading services
BMP-1	Infantry Fighting Vehicle	1,000	400	1966	Production probably ended around the late 70's
BMP-2	Infantry Fighting Vehicle	150	150	Late 70's	Production line is still open only for maintenance/upgrading services
BMP-3	Infantry Fighting Vehicle	22	22	1990	Low production rate
MT-LB	Multi-Purpose Tracked Vehicle	250	250	Early 60's	Production probably ended in the late 80's and, since today there are no production lines in Russia (only Ukraine and Bulgaria have them), there are plans for establishing a repair facility
BTR-60	Armoured Personnel Carrier	750	?	1960	1976
BTR-70	Armoured Personnel Carrier	1,000	?	1972	Production probably ended around the early 80's
BTR-80	Armoured Personnel Carrier	900	?	1984	Production line is still open only for maintenance/upgrading services
120 mm 2S12	Mortar	200	143	1981	Production line is still open but probably there is no real production rate
152 mm 2S3	Self-Propelled Howitzer	400	18	1970	Probably in the early '90
122 mm 2S1	Self-Propelled Howitzer	140	95	1971	1 Production line is still open only for maintenance/upgrading services
152 mm 2S19	Self-Propelled Howitzer	200	140	1989	Production line is still open but probably there is no real production rate
122 mm 9P138	Multiple Rocket System	100	96	1963	Production line is still open only for maintenance/upgrading services
122 mm D-30	Howitzer	45	10	1963	Probably in the early '80
120 mm 2S9	Armoured Gun/Mortar	150	75	1981	Probably in the late '80
120 mm 2S23	Armoured Gun/Mortar	20	10	1996	Low production rate
120 mm 2B16	Gun/Mortar	?	18	1986	Probably in the early '90
Strela-2/2M (SA-7)	Manportable SAM	250	250	1969	Production line is still open only for maintenance/upgrading services
Igla-1 (SA-16)	Manportable SAM	?	?	1983	In production
Igla (SA-18)	Manportable SAM	?	?	1983	In Production
Antey 9K33 (SA-8)	Low-Altitude SAM	50	2	1974	Probably in the early '90
Nudelman 9K31 (SA-9)	Low-Altitude SAM	100	30	1968	Probably in the early '90
Strela 10 (SA-13)	Low-Altitude SAM	?	20	1975	Production line is still open only for maintenance/upgrading services
23 mm ZSU-23-4	Self-Propelled AAG	?	60	1965	1983



As shown above, with regard to Naval Infantry units:

- out of 167 MBTs, 59.88 percent were designed between 1965 and 1975, 47.90 percent between 1975 and 1985, and 4.19 percent between 1985 and 1995;
- out of 50 Reconnaissance Vehicles, 100 percent were designed between 1955 and 1965;
- out of 60 Anti-Tank Vehicles, 100 percent were designed between 1955 and 1965;
- out of 572 IFVs, 69.93 percent were designed between 1965 and 1975, 26.22 percent between 1975 and 1985, and 3.84 percent between 1985 and 1995;
- out of 250 Multi-Purpose Tracked Vehicles, 100 percent were designed between 1955 and 1965;
- out of 143 Mortars, 100 percent were designed between 1975 and 1985;
- dei 253 Self-Propelled Howitzers, 44.66 percent were designed between 1955 and 1965, and 55.33 percent between 1985 and 1995;
- out of 96 Multiple Rocket Systems, 100 percent were designed between 1955 and 1965;
- out of 10 Howitzers, 100 percent were designed between 1955 and 1965;
- out of 103 Armoured Gun/Mortars, 72.81 percent were designed between 1975 and 1985, 17.47 percent between 1985 and 1995, and 9.70 percent between 1995 and 2005;
- out of 250 Manpads, 100 percent were designed between 1965 and 1975;
- out of 52 Low Altitude SAMs, 100 percent were designed between 1965 and 1975;
- out of 60 Self-Propelled AAGs, 100 percent were designed between 1955 and 1965.



As shown above, with regard to the Naval Infantry units:

- out of 167 MBTs, 95.80 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services, and 4.19 percent are part of construction blocks still in production, though at a lower pace;
- out of 50 Reconnaissance Vehicles, 60 percent have a level of obsolescence dating back to the period 1965-1975, and 40 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services;
- out of 60 Anti-Tank Vehicles, 100 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services;
- out of 572 IFVs, 69.93 percent have a level of obsolescence dating back to the period 1975-1985, 3.84 percent are part of construction blocks that are still in production, though at a lower pace, and 26.22 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services;

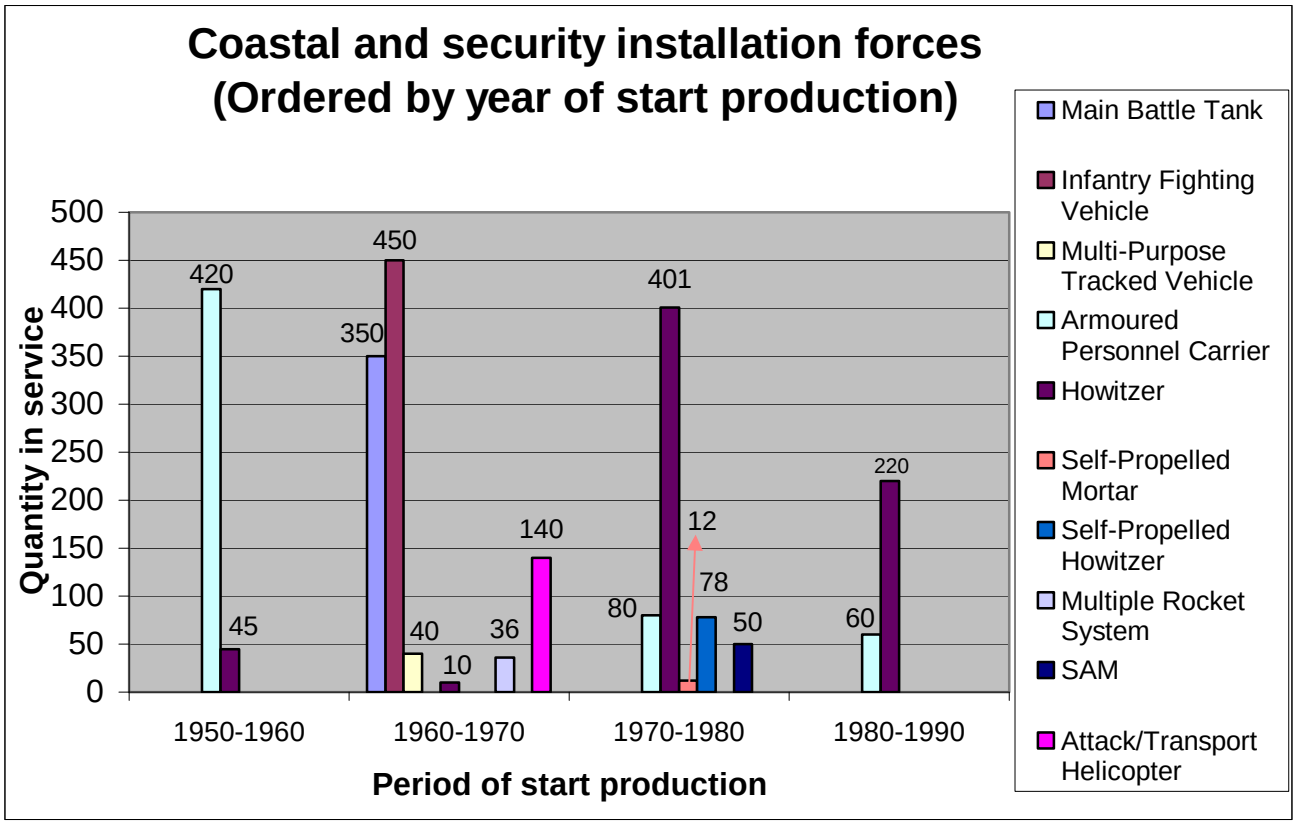
- out of 250 Multi-Purpose Tracked Vehicles, 100 percent have a level of obsolescence dating back to the period 1985-1995;
- out of 143 Mortars, 100 percent are part of construction blocks in production (so, their obsolescence can probably slowed down by the possibility of maintenance/upgrading services), though without any production rate;
- out of 253 Self-Propelled Howitzers, 7.11 percent have a level of obsolescence dating back to the period 1985-1995, 55.33 percent are part of construction blocks in production (so, their obsolescence can probably slowed down by the possibility of maintenance/upgrading services), though without any production rate, and 37.54 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services;
- out of 96 Multiple Rocket Systems, 100 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services;
- out of 10 Howitzers, 100 percent have a level of obsolescence dating back to the period 1975-1985;
- out of 103 Armoured Gun/Mortars, 90.29 percent have a level of obsolescence dating back to the period 1985-1995, and 9.70 percent are part of construction blocks still in production, though at a lower pace;
- out of 250 Manpads, 100 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services;
- out of 52 Low Altitude SAMs, 61.53 percent have a level of obsolescence dating back to the period 1985-1995, and 38.46 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services;
- out of 60 Self-Propelled AAGs, 100 percent have a level of obsolescence dating back to the period 1975-1985.

The equipments for Russian "force protection units"

This category includes the equipments supplied both to the security units of RVSN and the Coastal security units. The overall situation is the following[10]:

[10] Data drawn from Jane's Sentinel Security Assessment - Russia And The CIS, 2007, *Russian Federation, Strategic Rocket Forces*, 11-Jan, www.janes.com; Jane's Sentinel Security Assessment - Russia And The CIS, 2007, *Russian Federation, Navy*, 5-Jul, www.janes.com; IISS, 2007, *The Military Balance*, Rutledge, Abingdon; Yanko Eugene, 2007, *Russian Arms 2007*, Edition X3 April, www.warfare.ru; http://www.artillery-mz.com/.

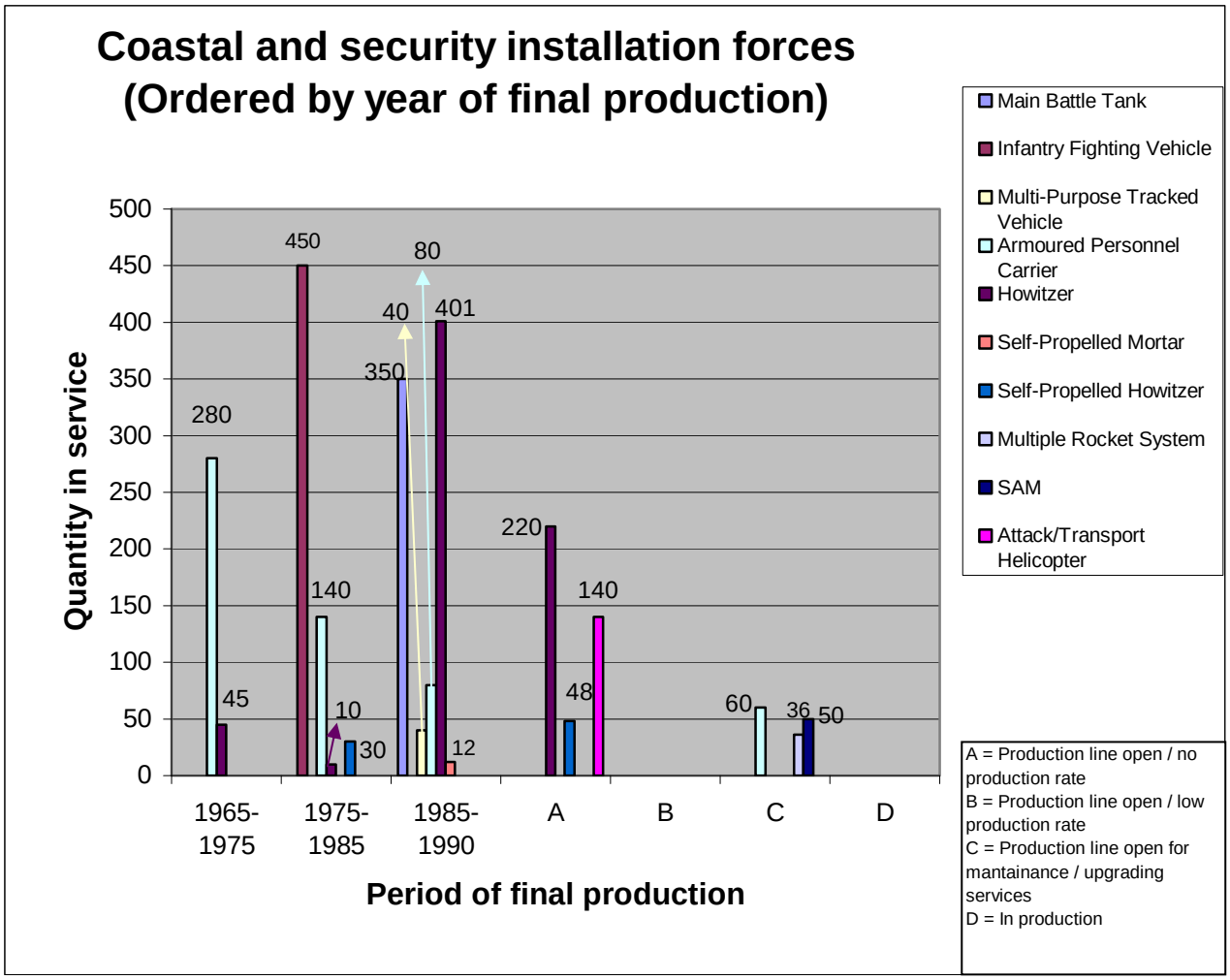
Type	Role	Quantity	In Service	Year of star production	Year of end production
T-64	Main Battle Tank	4,000	350	1964	1987
BMP series (probably most of them are BMP-1)	Infantry Fighting Vehicle	?	450	1966	Production probably ended around the late 70's
MT-LB	Multi-Purpose Tracked Vehicle	?	40	Early 60's	Production probably ended in the late 80's and, since today there are no production lines in Russia (only Ukraine and Bulgaria have them), there are plans for establishing a repair facility
BTR-50	Armoured Personnel Carrier	1.000	280	Early 50's	Production probably ended around the late 60's
BTR-60	Armoured Personnel Carrier	140	140	1960	1976
BTR-70	Armoured Personnel Carrier	80	80	1972	Production probably ended around the early 80's
BTR-80	Armoured Personnel Carrier	60	60	1984	Production line is still open only for maintenance/upgrading services
152 mm D-20	Howitzer	150	40	1955	Probably in the early '70
152 mm 2A36	Howitzer	401	401	1976	In the late '80
152 mm 2A65	Howitzer	320	220	1987	Production line is still open but probably there is no real production rate
130 mm M-46	Howitzer	?	5	1951	Probably in the early '70
122 mm D-30	Howitzer	140	10	1963	Probably in the early '80
240 mm 2S4	Self-Propelled Mortar	20	12	1975	Probably in the early '80. The laser-guided Smel'chak projectile should be still available
203 mm 2S7	Self-Propelled Howitzer	30	30	1975	Probably in the early '80
152 mm 2S5	Self-Propelled Howitzer	50	48	1976	Production line is still open but probably there is no real production rate
122 mm BM-21	Multiple Rocket System	70	36	1963	Production line is still open only for maintenance/upgrading services
SS-C-1B	Surface-to-Surface Missile	?	?		
SS-C-3	Surface-to-Surface Missile	?	?		
30 mm + 9M311/2S6 (SA-19) ZSU-30-2	Combined (SAM and guns) Self-Propelled AAG	?	?	1986	In production at low production rate
Various SAM series (probably most of them are SA-7)	SAM	50	50	1969	Production line is still open only for maintenance/upgrading services
Mil Mi-8	Attack/Transport Helicopter	140	140	1967	Production line is still open but probably there is no real production rate



As shown above, with regard to the Coastal and installations security units:

- out of 350 MBTs, 100 percent were designed in the 1960s;
- out of 450 IFV, 100 percent were designed in the 1960s;
- out of 40 Multi-Purpose Tracked Vehicles, 100 percent were designed in the 1960s;
- out of 560 APCs, 75 percent were designed in the 1950s, 14.28 percent in the 1970s, and 10.71 percent in the 1980s;
- out of 676 Howitzers, 6.65 percent were designed in the 1950s, 1.46 percent in the 1960s, 59.31 percent in the 1970s, and 32.54 percent in the 1990s;
- out of 12 Self-Propelled Mortars, 100 percent were designed in the 1970s;
- out of 78 Self-Propelled Howitzers, 100 percent were designed in the 1980s;
- out of 36 Multiple Rocket Systems, 100 percent were designed in the 1960s;
- out of 50 SAMs, 100 percent were designed in the 1970s;

out of 140 Helicopters, 100 percent were designed in the 1960s.



As shown above, with regard to the Coastal and installations security units:

- out of 350 MBTs, 100 percent have a level of obsolescence dating back to the period 1985-1995;
- out of 450 IFVs, 100 percent have a level of obsolescence dating back to the period 1975-1985;
- out of 40 Multi-Purpose Tracked Vehicles, 100 percent have a level of obsolescence dating back to the period 1985-1995;
- out of 560 APCs, 50 percent have a level of obsolescence dating back to the period 1965-1975, 25 percent to the period 1975-1985, 14.28 percent to the period 1985-1995, and 10.71 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services;
- out of 676 Howitzers, 6.65 percent have a level of obsolescence dating back to the period 1965-1975, 1.46 percent to the period 1975-1985, 59.31 percent to the period 1985-1995, and 32.54 percent are part of construction blocks in production (so, their obsolescence can probably slowed down by the possibility of maintenance/upgrading services), though without any production rate;
- out of 12 Self-Propelled Mortars, 100 percent were designed between 1985 and 1990;
- out of 78 Self-Propelled Howitzers, 38.46 percent were designed between 1975 and 1985, and 61.53 percent are part of construction blocks in production (so, their

obsolescence can probably slowed down by the possibility of maintenance/upgrading services), though without any production rate;

- out of 36 Multiple Rocket Systems, 100 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services;
- out of 50 SAMs, 100 percent are part of construction blocks whose obsolescence can be slowed down by the possibility of maintenance/upgrading services;
- out of 140 Helicopters, 100 percent are part of construction blocks in production (so, their obsolescence can probably slowed down by the possibility of maintenance/upgrading services), though without any production rate.

Russian Navy

Organisation, structure and equipment

Russian Federation Navy experiences a difficult phase, after a long period of serious financial and moral crisis.
The heir to the former Soviet Navy, Russian Federation Navy inherited most of its naval assets and infrastructures, as well as obviously most of its personnel.
However, the division of what remained of the second more powerful Navy in the world caused – or deepened – heavy imbalances, including scarce support and maintenance capabilities for naval assets and carrier-based systems, and a low ship-building capacity of Russian shipyards, unable to build those great surface vessels that were a specialty of Nikolayev shipyards (now based in Ukraine).
Moreover, the downsize of the Navy wasn't the outcome of a conscious plan for creating a force tailored to the post Cold War scenario, but just the effect of a dramatic attrition to its components – bases, ships and personnel – imposed by the lack of resources.
The dimension of downsize was further increased by the tendency of Soviet Navy to maintain commissioned obsolete ships, even if of modest combat use.
If the Army always tended to preserve any weapon system, even after many years from its substitution, for any unexpected need, Russian Navy historians refer the opposition to decommissioning any "floating" vessel.
Also, the naval build-up during Gorshkov era wasn't sustained by a consistent increase in bases and repair facilities. By the late Eighties many vessels, most of them nuclear powered submarines, reached the end of their technical life; without the facilities for their decommissioning, they were simply amassed in the overcrowded bases, creating an environmental nightmare.
The lack of resources heavily affected the ability of the Navy to exercise the crews as well.
In 2000 the average annual at-sea time per ship was 6.4 days, of which only 0.5-day in tactically mixed groups. The average annual flying time for crews was 21.7 hours; out of 584 naval aviation crews, only 156 remained combat ready, and just 77 with night-time fly qualification[11].

It is a problem common to other branches of Russian armed forces as well; as to the Navy, however, it must not be ignored that a new naval asset needs a long time to be realized, even more so in the case of a new Unit's type.
In fact, after the collapse of the Soviet Union most of the conceptual premises that were at the basis of the creation of the various Unit's classes of the Soviet Navy have faded.
At the time, the Soviet Navy had the strategic task to guarantee the country the capability of launching a second, devastating nuclear strike against the United States – and against any other enemy –, even after an eventual surprise attack that could annihilate both Soviet land-based nuclear arsenal and strategic bombers.

[11] Andrea Grazioso, *"The impending impotence of Russian Navy"*, 2004

This function has always been typical of nuclear powers' Navies, and in the case of the Soviet Union it meant maintaining a huge fleet of nuclear-powered ballistic missile submarines.
As the priority was to secure the survival of that fleet in every circumstance, there was the need to prepare some overseas bases, with proper defence systems that could face the threat posed by the ASW systems of the United States and other potential hostile countries.
The Soviet surface fleet was tasked with creating these "naval bastions", which was a mainly defensive assignment, despite the size of its heavily-armed vessels and their potential of carrying out overseas missions.
The Soviet Fleet also had the task of actively counteracting US Navy – particularly their aircraft carrier groups – in every area of the world where the latter could pose a threat to the Soviet interests.
To this end, the Soviet Navy had powerful offensive units, including nuclear-powered submarines armed with anti-ship missiles and long-range torpedoes, heavily armed nuclear- and conventionally-powered cruisers, and a land-based air force unrivalled in the world for its numerous long-range offensive aircrafts for naval interdiction.
Finally, the Soviet Navy was in charge of sustaining the overall war effort of the country, even in areas of operations far from the homeland, through the control and the exploitation of maritime communications.
While the Soviet Union represented the continental power *par excellence*, the development of its Navy and Merchant Marine highlighted its intention and capability of taking strategic advantage of the oceans as well.
In fact, beside a military amphibious component – poorly developed if compared to the US's one – there was the huge transport capacity of the Merchant Marine, with its high number of container-carrying and roll-on roll-off vessels of great tonnage and range.
In other words, the Soviet Union had built a powerful naval instrument that fitted to its overall military strategy, and was perfectly connected with the maritime capacity assured by Russian Merchant and Fishing Marine, which in turn would contribute to the economy of the country, both in peacetimes and in case of a conflict.
After the collapse of the Soviet Union and the dismantling of its Armed Forces, Russia inherited most of its remaining naval assets, even though the overall balance of its Fleet was damaged.
Russia lost significant stretches of coast on both the Black Sea and the Baltic Sea, along with the shipyards and ports that were there.
Above all, a new Russian military strategy took a long time to be planned, which was related to the overall confusion that reigned in the country during the decade that followed the Soviet Union's collapse.

As a result, Russian military and political leaderships had some troubles in finding a mission to serve as guidance for Russian Navy, thus hampering a rational planning of forces.
For many years, Russian navy was seen as one of the several troublesome legacies of the Soviet Union – an instrument of dubious usefulness with a heavy maintenance burden.
The deficiency of available resources to assure the overhauling, as well as the lack of resources for new constructions, helped to deteriorate the Russian fleet.
The absence of a precise plan to determine the role, the scope and the optimal structure of the Navy also prevented from focusing the scarce resources at disposal on those naval assets that, due to their operative value in the new political contest, should have been safeguarded.

There have been a profound and generalized deterioration of naval assets and support infrastructures, which was particularly serious in the case of those units that had higher maintenance costs.
The nuclear-powered submarine fleet was wept out in the 15 years after the Soviet collapse, and many cruiser and destroyer classes rusted because of the inability to pay for crews' keep, who could have assured at least a certain maintenance capacity.
Russian navy is therefore what remains of at least three "system shocks": first, the collapse of the Soviet Union and the dismantling of its Armed Forces; then, the incapacity of Russian political and military authorities to give the Navy a precise operative task and plan the future structure of the forces; finally, the prolonged, serious scarcity of funds for both new constructions and maintenance and training projects.

Today's Russian Navy

In the post-Cold War era, we enjoy a great deal of information available about the size and the structure of Russia's Armed Forces.
Nonetheless, the international interest in Russia's Armed Forces has diminished as a consequence of both the end of the Est-West confrontation and the apparent Russia's loss of military power status.
For this reason, in the last twenty years the amount and quality of information about Russia's Armed Forces did not change that much, in spite of the boom of open sources.
Through the consultation of the main specialized reviews, it is possible to find the order of battle (see Annex 1)

Basic comments on the present state of major surface and submarine vessels

Surface Combatant Vessels

Aircraft carrier Admiral Kuznetsov

Laid down at the Nikolaev Yards in 1982, the CV Kuznetsov (former "Riga", "Leonid Brezhnev" and "Tblisi") was assigned to the Black Sea Fleet in the 1991. By the end of 1991 she crossed the Bosfor streets and moved to the Vidyaevo naval base, Northern Fleet. During her first years suffered frequently damages to her steam boilers, thus requiring reiterated overhauls. The training with the carried wing was often discontinued due to lack of funds and technical shortcomings. Between 2006 and 2007 underwent a new long overhaul. CV Kuznetsov has participated to relatively complex exercises in the Atlantic Ocean and in the Mediterranean, but never carried out a real deployment. This, coupled with the ship's uncertain reliability and the sporadic training of her carrier wing, makes the Kuznetsov an asset of doubtful capability and with a rather low operational availability and combat readiness. However, the overall potentiality of the ship's design could allow a rise in combat effectiveness and a prolonged service life, if adequate funding for a frequent and accurate maintenance will be provided.

Battle cruisers Kirov class

Petr Velikiy

Laid down in the Baltiiskyy Shipyards in 1986, the BCGN Petr Velikiy (former "Yury Andropov") was launched in 1989 but the progress in the construction of this fourth vessel of Kirov class substantially slowed down due to the collapse of the Soviet Union. The first sea trials were complete only in 1995. Presently assigned to the Northern Fleet, the Petr Velikiy frequently exercises at sea in any major exercise or Russian navy during the last ten years. It is probably one of the most active and combat ready vessel in the Fleet and could remain in service for a long period.

Admiral Nakhimov

Laid down in the Baltic Shipyards in 1983 and commissioned in 1988, Adm. Nakhimov (ex "Kalinin") was the third vessel of the Kirov class. Assigned to the Northern Fleet in 1989, since 2004 she is under a comprehensive refit. According to political statements from Russian Minister of Defence, Adm. Nakhimov should re-enter in service in 2008 and could be assigned either to the Pacifc Fleet or the Northern Fleet.

Cruisers Slava class

Moskva

Laid down in the Nikolaev Shipyards in 1976 and commissioned in 1982, since 1983 the Moskva (ex "Slava")is assigned to the Black Sea Fleet. The vessel has been relatively active also during the last fifteen years, with frequent deployment in the Mediterranean and visiting Italian and Greek naval bases. Deployed for training in the Indian Ocean in 2003. Cruiser Moskva seems a reliable vessel and has strongly contributed to the training of Russian crews during the last decades. She could remain in service for several year more, although she has 25 years of active service and never underwent a major refit. Probably she will remain the flagship of the Black Sea Fleet and will operate consequently for show-the-flag missions.

Marshal Ustinov

Laid down in the Nikolaev Shipyard in 1978 and commissioned in 1986, the Marshal Ustinov (ex Adm. Lobov) was assigned to the Northern Fleet. In the late Eighties – early Nineties the Cruiser often visited US and Canadian bases. In 1997 she started a major overhaul in St. Petersburg. Could remain in service many years more, if adequate funding for periodic repairs will be provided.

Destroyers, Sovremenny class

Beyevoy

Laid down in 1982 in Severnaya Shipyards, the Beyevoy DDG, sixth destroyers in the original Sovremenny class was assigned in 1986 to the Pacific Fleet. Since then, she has visited North Korean and US bases and received an overhaul in 1993.

Bystry

Laid down in 1985 in Severnaya Shipyards, Bystry was the 11th Sovremenny built. Assigned to the Pacific Fleet, Bystry has visited China and South Korea in 1993. Between 1993 and 2002 has received an extensive overhaul. In August 2006 participated to the naval parade of the Pacific Fleet.

Bespokoiny

Laid down in 1987 in Severnaya Shiyards, Bespokoiny was the 15th Sovremenny built. Assogned to the Baltic Fleet, she participated to the BALTOPS exercise in 1997. Between 2004 and 2006 received an overhaul. Actual status is still uncertain.

Nastoychivy

Laid down in 1988 in Severnaya Shipyards, Nastoychivy (ex Moskvsky Komsomolets) was the 16th destroyers of the original Sovremenny type. Assigne to the Baltic Fleet, in 1993 she visited Kiel. Took part of Baltin Fleet naval parade in Kaliningrad in 2006 and received a visit by a Sweden delegation in December the same year.

Admiral Ushakov

Laid down in Severnaya Shipyards in 1990, Adm. Ushakov (ex Besstrashny) was the 17th destroyers of the Sovremenny class. Assigned to the Northern Fleet, she escorted the CV Kuznetsov in 1995 deployment. Received an overhaul in 2001-2003.

Destroyers, Udaloy and Udaloy II class

Admiral Tributs

Laid down in Severnaya Shipyards in 1980, Adm. Tributs was assigned to the Pacific Fleet in 1986. Since then, she was relatively active, with frequent visits in foreign bases in the Pacific and Indian Ocean region. In December 2005 took part of military exercises with Indian Ocean.

Admiral Levchenko

Laid down in Severnaya Shipyards in 1982, Ad. Levchenko (ex Khabarovsk)was assigned to the Northern Fleet in 1989. Visited a French base in 1993. Received a refit between 1999 and 2001. Since then se has been relatively active, with frequent exercises in the Northern Fleet traditional area of deployment.

Marshal Shaposhnikov

Laid down in Yantar Shiyards (Kaliningrad) in 1983, Marsh. Shaposhnikov was assigned to the Pacific Fleet in 1986. Since then, she was frequently deployed in the Pacific and Indian Ocean for military exercises. In July 2005 took part to the Russian-US joint exercises and the

moth later to the Russia-China joint "Peace mission 2005" exercise. Further joint activity with US Navy in 2006.

Severomorsk

Laid down in Yantar Shipyards (Kaliningrad) in 1984, the Severomorsk (ex-Simferopol) was assigned to the Northern Fleet in 1988. In 1991 she visited a US base. Between 1988 and 2001 she received a substantial overhaul, with the replacement of all four engines. Participated to the Kursk rescue operation in 2001.

Admiral Vinogradov

Laid down in the Yantar Shipyards (Kaliningrad) in 1986, the Adm. Vinogradov was assigned to the Pacific Fleet in 1989. Since then she was rather active with frequent deployments in Pacific and Indian Ocean and joint exercises with US and Japanese Navies Overhauled in 2001 and again in 2003.

Admiral Panteleyev

Laid down in the Yantar Shipyards (Kaliningrad) in 1987, the Adm. Pantaleyev was assigne to the Pacific Fleet in 1992. Since then, she visited China, Republic of Korea, United States, India, Singapore and Indonesia in periodic deployments for joint exercises in Pacific and Indian Ocean.

Admiral Chabanenko

Laid down in 1990 in the Yantar Shipyards (Kaliningrad), the Adm. Chabanenko (ex-Admiral Basistiy) is the only destroyes of the Udaloy II type and is assigned to the Northern Fleet. Adm. Chabanenko is probably the most combat-ready vessel in the Russian Navy, and is often deployed for joint exercises with foreign Navies, as well as for visit exchanges in foreign bases.

Frigates, Krivak and Krivak II class

Neukrotimy

Laid down in the Yantar Shipyards (Kaliningrad) in 1976, the Neukrotimy (ex-Komsomolets Litvi) is a Krivak-II type Frigate and was assigned to the Baltic Fleet in 1978. Very active before 1989, with deployments to South Atlantic and Western African ports, she has since maintained a high degree of combat training. Suffered a major breakdown in 2005 but was repaired. In 2006 took part to the Naval Parade in Kaliningrad.

Pylky

Laid down in 1976 in the Severnaya Shipyards, the Pylky is a Krivak-I type Frigate and was assigned to the Baltic Fleet in 1979. Received an overhaul in 1993. She remains partly active, although there are not known deployment outside the Baltic in recent years.

Pytlivy

Laid down in 1979 in the Yantar Shipyard (Kaliningrad), the Pytlivy is a Krivak-II type Frigate and was assigned to the Black Sea Fleet in 1982. Received a substantial overhaul in the 1993 – 1997 period. In 2004 took part of joint Russia-NATO exercises in the Mediterranean. In 2005 deployed in the Indian Ocean, as escort of Cruiser Moskva. The same year took part to joint Russia-Turkey and Russia – Italy exercises. Again in the Mediterranean in 2006, when visited Italy and Lebanon. Took part to the joint Russia – NATO Active Efforts exercise in 2006.

Frigate Neustrashimy class

Neustrashimy

Laid down in 1987 in the Yantar Shipyards (Kaliningrad), the Neustrashimy is the first and single Frigate of a new post-Krivak class. Assigned to the Baltic Fleet in 1991, she has been

rather active during all her service, with frequent deployments in the Atlantic Ocean for joint exercises and exchange of visits in France, Portugal, Spain. Also visited Germany and Sweden.

Submarine vessels

SSBN Typhoon class

Dmitry Donskoy

First SSBN of the Typhoon (NATO code name) class, the Dmitry Donskoy was assigned to the Northern Fleet in 1982. in the 1983-84 period tested the missile launch systems. Repaired and refitted in the 1989-91 period. In the 2003 further refitted as a test bed for the new SLBM Bulava. Successful launches of the new missile in 2005 and 2006.

Arkhangelsk

Fifth of the Typhoon class, the Arkhangelsk entered in the Northern Fleet in 1988. Refitted in 2002. In 2004 took part to Navy exercises with President Putin aboard.

Severstal

Sixth of the Typhoon class, the Severstal eneterd in the Northern Fleet in 1990. successfully launched a SLBM in 1996. Refitted in the 2001-2002 period. Exact status unknown. Perhaps awaiting a refit for a new SLBM.

SSBN Delta IV class

Verkhoturie

First SSBN of the Delta IV class, entered in the Northern Fleet in the late eighties. Overhaul in the second half of the nineties. Returned into active service in 1999. Current status uncertain. Perhaps in reserve.

Ekatirenburg

Laid down in 1982 in the Severodvinsk Shipyards. Second vessel of the Delta IV type. In 2005 successfully launched an SLBM. New successful launch in 2006. The Captain was received by President Putin in the Kremlin in 2006.

Tula

Completed in 1989, the Tula SSBN received an overhaul between 2004 and 2006. Assigned to the Northern Fleet.

Bryansk

Laid down in 1981 in the Severodvinsk Shipyards and completed in 1990, Bryansk was overhauled in 2004-2006 and re-entered in active service in September of the same year.

Novomoskovsk

Completed in 1992, the Novomoskovsk is the 7th vessel of the Delta IV class of SSBN. In 1998, 2000 and 2001 successfully launched ballistic missiles, also from submerged position. Overhauled in 2003, failed to launch SLBM in 2004 and 2005 (perhaps for faulty missiles). Should receive a new refit soon.

SSBN Delta III class

Borisoglebsk

Completed in 1977 and assigned to the Northern Fleet. Repaired and partly refitted in 1985-86 and 1991-93. Awarded prizes for missile training in 1997, 1998 and 1999. Successfully

launched a SLBM in 2000 with President Putin aboard. Failed to launch a satellite vector in 2001.

Zelenograd

Completed in 1978, she entered in the Northern Fleet in 1979 and then moved to the Pacific Fleet in 1981. Repaired in 1990. Overhauled in 2003 – 2005 period. Assigned to the Pacific Fleet.

Petropavlovsk

Completed in 1979, initially assigned to the Northern Fleet, then moved to the Pacific in 1985. Successfully launched SLBM in 1996. Assigned to the Pacific Fleet.

Georgiy Pobedonosets

13th vessel of the Delta III class, she was assigned to the Northern Fleet in 1980. Under repair between 1993 and 2003. Active in the Pacific Fleet since 2003.

SSGN Oscar II class

Smolensk

Laid down in 1986 in the Sevmash Shipyards, Smolensk entered in the Northern Fleet in 1991. She was awarded with prices for successful launches of cruise missiles in 1993 and 1994, and again in 1998. Participated in the Zapad-99 exercise. Present status not known. Probably in need of overhaul.

Chelyabinsk

Laid down in 1987 in the Sevmash Shipyards. Assigned to the Northern Fleet, moved to the Pacific in the 191. Received an overhaul in 2002-2004. In active service in the Pacific Fleet.

Viluchinsk

Laid down in 1988 and assigned to the Northern Fleet in 1993. In 1993 surfaced near the Northern Pole. Moved to the Pacific Fleet in 193 and in 1996 successfully launched cruise missiles. In 1996 suffered a damage during a combat patrol. Overhauled in 1997-2001 period, re-entered in the Pacific Fleet in 2002.

Orel

Laid down in 1989, 7th vessel of the Oscar II class. Assigned to the Northern Fleet in 1993, successfully launched cruise missiles in 1995. Deployed for combat patrols in 1996. Active in the Northern Fleet.

Omsk

Laid down in 1989 and completed in 1993, 8th vessel of the Oscar II class. Assigned to the Northern Fleet in 194, the Omsk moved to the Pacific in the same year, with an under ice cruise. Missile launche in 1997 and several combat patrol since then. Active with the Pacific Fleet.

Tomsk

Laid down in 1991 and completed in 1996, the following year Tomsk entered in the Northern Fleet, then moved to the Pacific Fleet in 1998, with a 3,500 miles-long under-ice cruise.

SSN Akula class

Nine vessels, completed between 1987 and 2001.

SSN Alfa class

One vessel, completed in 1979.

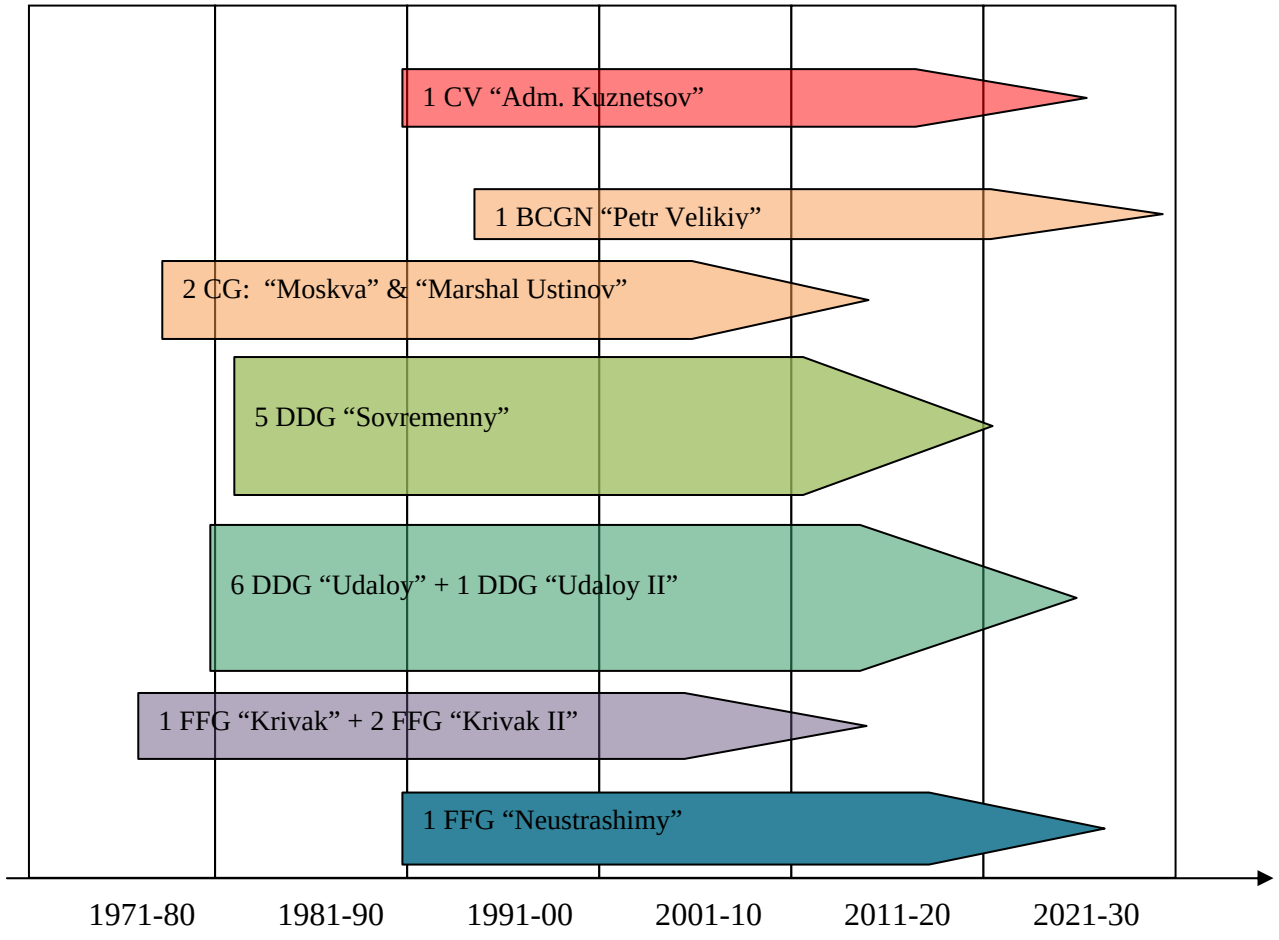
SSN Sierra and Sierra II classes
One plus two vessels, completed between 1987 and 1993.

SSN Victor III class
Four vessels, completed between 1988 and 1992.

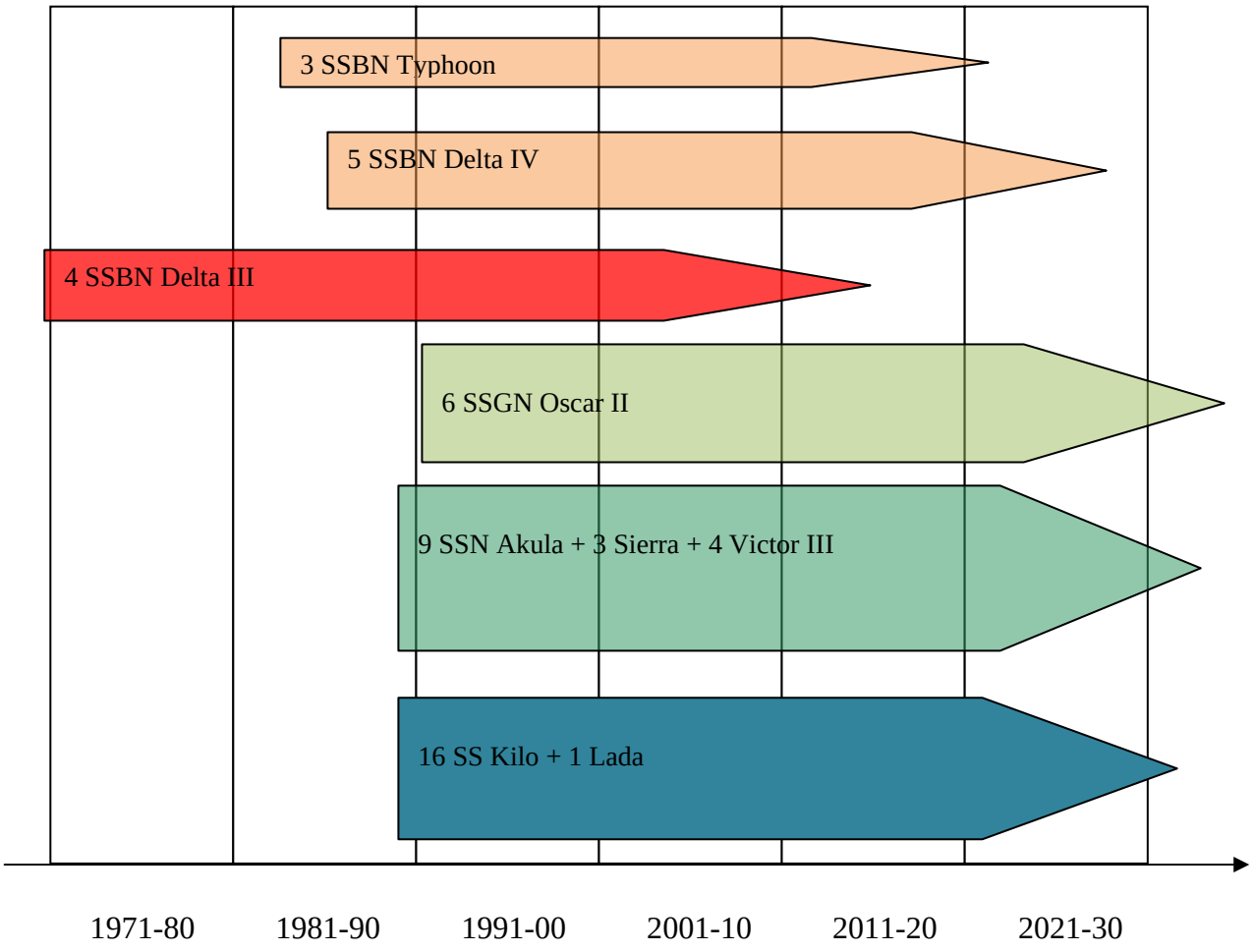
SSK Kilo and Lada classes
Sixteen plus one vessels, completed between 1988 and 2006.

A synthetic depiction of the present state of Russia's Navy and the expected composition in the next decades

Major Surface Combatant Vessels



Major submarine vessels



Criteria adopted for the graphic depictions

The aim of these visual representations is to provide very synthetic pictures, for surface vessels and submarines respectively, able to give an immediate outlook of the present reality of Russian Navy and of its likely composition in the next decades.
Each arrow represents a single type of vessel. The silhouette starts in the year of the initial construction of the ship, or of the first ship in the class. Its height varies in accordance with the number of the vessels in each class, although it is not proportional to this number. The height simply provides a very rough indication of the numeric relevance of that type of vessels.
The silhouette is arrow-shaped, in order to show that the number of vessels in each class, and their effectiveness, tend to dwindle in the final period of service life.
Each silhouette has a different length, indicating a different expected lifespan.
This, in turn, is estimated according to the observation of the past activity of each vessel, the number and frequency of reported breakdowns, the frequency of overhauls and the number of surviving vessels of each type, out of the total number of vessels built.
In example, the Udaloy-type destroyers seem to be far more reliable and available than the almost contemporary Sovremenny-type destroyers. Therefore, a longer expected lifespan has been assigned to the Udaloy-type destroyers.
However, these graphics are not intended as a precise forecast of the composition of Russian Navy in the future, but as a practical tool for understanding the likely planning choices of Russian Navy in the next decade.

Strategic Nuclear Weapons

Although substantially reduced after the end of the Cold War, the availability of both nuclear devices and delivery assets remain impressive. Moscow continues to rely on its ability to deliver a devastating nuclear strike against any potential opponent in order to retain its super-power status.
Therefore, Russian nuclear stockpile remains the largest in the world.
In order to counterbalance the United States and other major powers, Russia deploys a large number of land-based and sea-based nuclear-armed ballistic missiles with a intercontinental range.
The land-based component is still based largely on the Soviet-era ICBM, but a growing number of new-generation SS-27 "Topol M" are becoming available. However, the production rate of these systems seems lower than originally estimated and perhaps as low as a dozen missiles per year. As a consequence, when the already extended service life of the old SS-18, SS-19 and SS-25 ICBM will finally reach the conclusion, Russia will probably field a much smaller force of ICBM.
On the other hand, Russian authorities have officially announced that they will develop and field a new re-entry vehicle with a modified trajectory able to defy the anti-ballistic systems under construction in the United States and planned in Europe.
This new re-entry vehicle could eventually be integrated also on the new Sea-Launched Ballistic Missile SS-N-30 "Bulava", still under development.
The "Bulava" is tested from a modified SSBN submarine of the Typhoon class, but is intended for operational service on the new SSBN Borei class, of which three vessels are under construction.

The defensive segment of the strategic forces is also under modernisation.
New radar and optical-tracking systems have been recently built in Belarus and Tajikistan, in order to renovate Russia's early warning capability and compensate for the loss of early-warning stations based in other former-Soviet countries and no longer available.
There is also a new interest in the active defence against enemy ballistic systems, although Russia's ballistic-missile defence program seems much less ambitious than the American one.
However, the SH-11 interceptor system deployed around Moscow is under modernisation, while the new S-400 anti-air anti-ballistic SAM is starting to enter in service, improving substantially the ABM defences against short and medium-range attacks.

Strategic Nuclear Capability – Offensive Land-Based Component

Type/Year of first deployment	Max Range (Km)	Number of launchers fields (total launchers: 506)	Number of missiles	MIRV capacity for each missile/(Yeld)/Total warheads
SS-18 Satan (the now-in-service R-32M2 version was built in 1988-92)	11.000-15.000	4	74 (in upgrading in order to extend the service life of approximately 40 R-36M2 until at least 2016)	4, 5, 10 (500-750 Kt); 740
SS-19 Stiletto (the now-in-service R-32M2 version was built since 1980)	10.000	4	126 (in upgrading in order to extend the service life of approximately 50 missiles by additional 20 years)	3, 6 (500-750 Kt); 756
SS-24 Scalpel (1984)		Being retired	Some rail-mobile version on the SS-24 are probably still in service, but they will be imminently scraped all the same	-
SS-25 Sickle (1985)	10.500	Road-mobile system	270 (in upgrading in order to extend the service lives of approximately 145 missiles until at least 2018)	Single warhead (550 Kt); 270
SS-27 Topol-M (1997)	10.500	5 Regiment each with 10 launchers (some of them are road-mobile)	50 (planned to be 64 by 2010 and 120 in 2015 for a total of a 70 silos and 50 road-mobile missiles)	Single warhead (550 Kt, potentially, it could embark until 3-6 warhead); 50

Strategic Nuclear Capability – Offensive Sea-Based Component

Type/Year of first deployment	Max Range in Km	Number of submarines	Quantity of tube launch for each submarine	Number of missiles	MIRV capacity for each missile/(Yeld)/Total warheads
SS-N-18 M1 Stingray (1977)	6.500	5 Delta III (expected to be retired during the next few years)	16	96	3 (200 Kt); 288
SS-N-20 Sturgeon (1983)	?	2 Typhoon (expected to be upgraded by replacing the Sturgeon with the Bulava SSBN)	20	60	?
SS-N-23 Skiff (1986)	9.000	6 Delta IV (probably they will remain in service until 2015-2020)	16	96	4 (100 Kt); 384
SS-N-30 Bulava (In final development; Based on SS-27 Topol-M technology)	8.300 (?)	1 Typhoon	?	?	6 (?); ?
		3 Project 955 Borei (two of them still in construction; at least one expected to enter in full operational service by 2009-2010)	12		

Strategic Nuclear Capability – Air-Launched Cruise Missiles

Type/Total Quantity/(Yield)	Number of airplanes/(Year of first deployment)/Range in Km	Quantity of cruise missiles carried by each aircraft
AS-15B 192 (200Kt)	16 Tu-160 Blackjack (1987); 10.500-13.200	12
AS-15A	32 Tu-95MS6 Bear-H6 (1981); 6.500-10.500	6

512 (200Kt)	(in upgrading in order to keep them in service for further 10 years)	
AS-15A 168 (200Kt)	32 Tu-95MS16 Bear H-16 (1981); 6.500-10.500 (in upgrading in order to keep them in service for further 10 years)	16

Strategic Nuclear Capability – Defensive Land-Based Component	
Type/Year of first deployment	**Quantity of missiles**
S-400/SH-08 Gazelle (1986-1989) A slow refitting program is in place	64 (they can carry single 1000/10Kt warheads)
SH-11 Gorgon (1986-1989) A slow refitting program is in place	36 (they can carry single 1000/10Kt warheads)
Sa-10 Grumble (1980)	1900 (approximately 600 are equipped with low yield nuclear warheads)

Strategic Nuclear Capability – Warning Systems	
Type of radar	**Quantity/Locations**
Over the Horizon	3 (Mukachevo, Nikolaev, Yeniseysk)
ABM	12 (1 in Pushkino [Moskow] 6 locations covering approaches from West and Southwest, Northeast and Southeast ,and partially South)
Phased Array	7 (Moskow, Olenegorsk [Kola], Gaballa [Azerbaijan], Baranovichi [Belarus], Pechora [Urals], Balkhash [Kazakhstan], Mishelevka [Irkutsk])

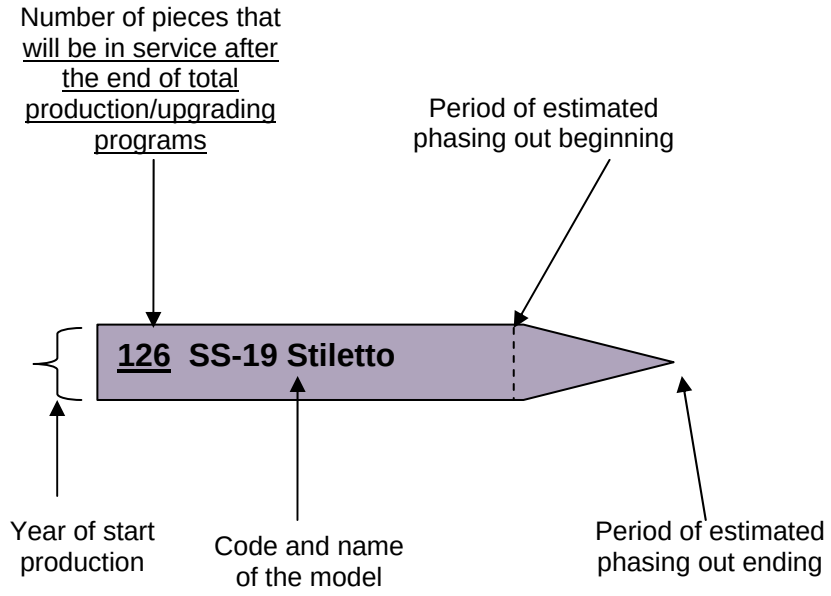
As for the state of other nuclear assets conceived for tactical or in-theatre employment, thus not related to the RVSN, the situation is as follows:

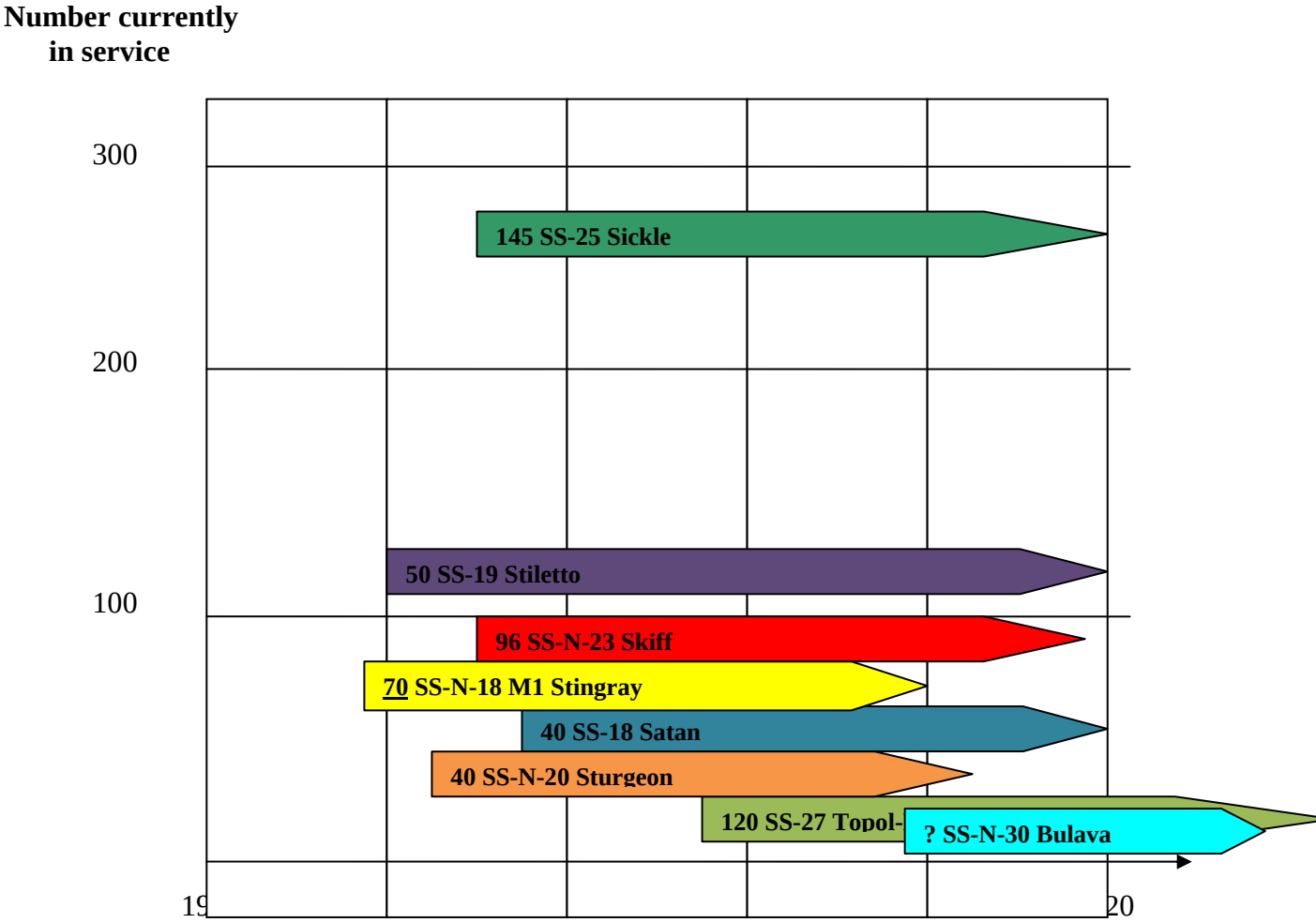
Other nuclear assets without strategic role				
Asset	**Type/Year of first deployment**	**Number**	**Type and quantity of weapons carried by each asset**	**Total warheads**
Air (Air Force)	Tu-22M Backfire (1974)	116	2 AS-4 ASM, bombs	974
	Su-24 Fencer (1974)	371	2 bombs	
Air (Naval Forces)	Tu-22M Backfire (1974)	58	2 AS-4 ASM, bombs	232
	Su-24 Fencer (1974)	58	2 bombs	
SLCM	SS-N-12; SS-N-19; SS-N-21; SS-N-22			266
ASW; SAM	SS-N-15; SS-N-16; various torpedoes; SA-N-3; SA-N-6			158

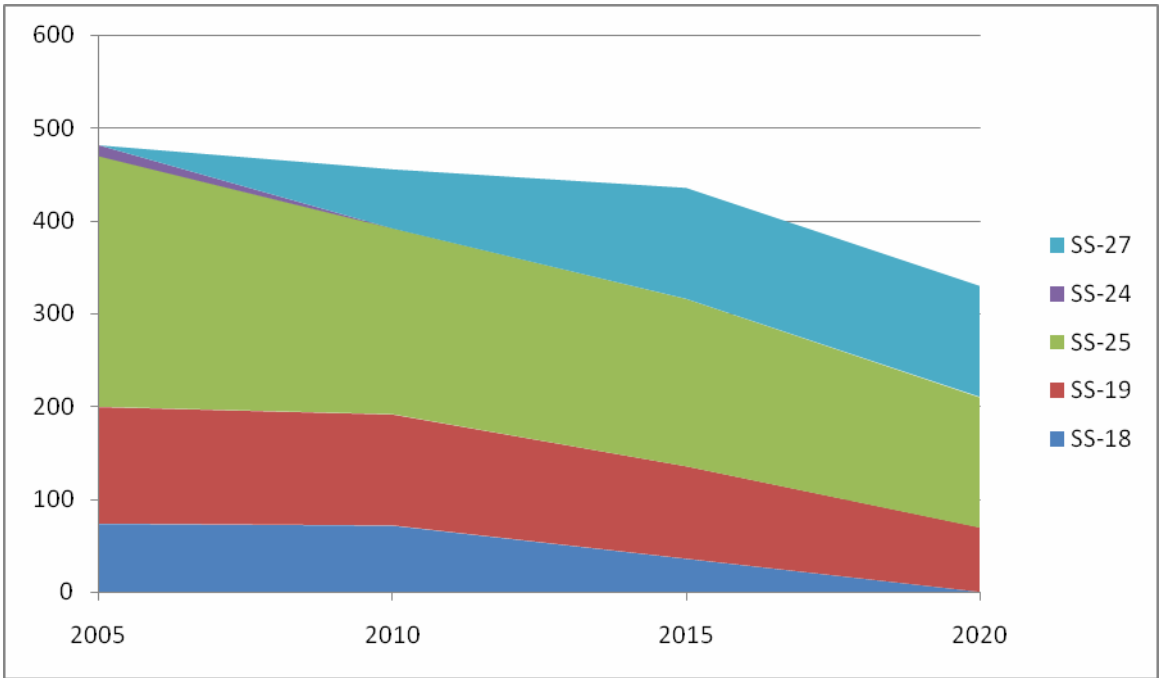
Considering both strategic and non-strategic nuclear forces, the overall situation is the following:

Total of deployed nuclear warheads:
approximately 5.670
(= 3.360 strategic offensive + 2.330 defensive and/or non-strategic)
(plus approximately 10.100 in storage and/or awaiting dismantlement)

The level of obsolescence of the ICBMs and SSBNs is shown in the following graphic:







The space component

Russia is one of two countries that are openly pursuing an aggressive military space policy; the other one is the US. An advanced spy-satellite was launched in the middle of 2004; Russia plans to launch 10 more satellites by 2010, a rather unrealistic aim considering the costs involved[12]. Moreover, Russia is implementing plans to improve , by 2010, the capacity of the satellite navigation system GLONASS through an increase from 12 to 24 of its satellites (like the Western GPS, GLONASS is a "dual-use" system, apt to civilian as well as military purposes).

[12] See Jane's Sentinel Security Assessment - Russia And The CIS, 2007, *Russian Federation*, *Procurement*, 13-Jun.

Russia's Air Force

Organisation, structure and equipment

The present effectiveness of Russia's Air Force is broadly similar to the average level expressed by the whole of Russia's military. Years of very reduced levels of funding have produced a substantial deterioration in terms of both obsolescence of equipments and lack of training.

For more than a decade, Russia's Air Force suffered such a chronic shortage of fuel and spare parts that the average activity of its pilots was far below the minimum required for any operational readiness. This inexorably increased the rate of fatal accidents and further reduced the operational output expressed during the real engagements in Chechnya.

At the same time, the procurement of new systems – aircraft, air-defence systems etc. – was negligible. Russia's air force carried on relying on the legacy of the Soviet equipments, and struggling with the unavoidable need of drastically reducing its own structure.

Between 1998 and 2005, Air Force personnel dropped from 318,000 to 180,000; the headquarters of five armies, 12 divisions and 70 regiments were disbanded; many airfields have been closed and there were also significant reductions in the number of training schools and institutions.[13]

In terms of organisation, the most notable change was the merger between (tactical or "frontal") Air Force and the Air Defence Force, which substantially contributed to the downsizing of the whole structure.

However, structural downsizing and rationalisation could only marginally reduce the pace of reduction in operational capabilities.

As far as the control of the air space is concerned, according to one source, [14] the radar coverage of the territory is now blinkered due to the reduced number of active radar stations and is guaranteed at low level over Moscow and other few areas only.

Tactical aviation units capabilities have been seriously reduced by the lack of new equipments and modern munitions. In particular, the strike capabilities relies on old-generation aircraft with few, if any, all-weather precision strike capabilities.

The pace of modernisation in the air-superiority fleet has been only slightly higher, with the introduction of a negligible number of new planes and the partial modernisation of few existing airframes.

As for the strategic aviation, today consolidated in the 37th Air Army, the existing fleet of medium and heavy bombers maintained a very low level of activity for more than a decade, loosing the ability to project a significant air power beyond Russia's borders.

The long-range fleet is still largely based on the propeller-driven Tu-95 which, although equipped with long-range cruise missiles, cannot face up to date air defences.

The medium-range Tu-22M still play a significant role at regional level, thanks to their ability to make supersonic dashes in less-defended theatres.

The number of Tu-160 remains too low for making a significant difference in the global contest; however Russia is expanding the role of these bombers, as well as the role of Tu-22M, for their employment in conventional strikes, in the contest of asymmetric conflicts.

[13] Jane's World Air Forces – Russia, december 2007
[14] Ibid.

Since 2003, the overall situation is improving thanks to an expanded budget both for operations and for procurement.
Tactical aviation crews now fly 80 – 100 hours per year, four times more than the average time during the Nineties.
Strategic aviation crews are again involved in routine long-range patrols, although these activities seem spurred by purely political considerations rather than a military planning at operational or strategic level.

Russia's Air Force Present Equipment

Strategic Air Force – 37th Air Army

Type	**Role**	**In Service**
Tu-22M-3 'Backfire'	Bomber	66
Tu-95MS6 'Bear-H6'	Bomber	39 [1]
Tu-95MS16 'Bear-H16'	Bomber	32
Tu-160 'Blackjack'	Bomber	15 [2]

Tactical Aviation – six Air Armies of combined formed Air Defence and Frontal Aviation

Type	**Role**	**In Service**
MiG-31 'Foxhound-A'	Interceptor	240
Su-27 'Flanker-B'	Interceptor	130
Su-27SM 'Flanker-B'	Interceptor	29
Su-30	Multirole Fighter	2
Su-30M	Multirole Fighter	5
Su-35 'Flanker'	Multirole Fighter	3
MiG-29 'Fulcrum-A/C'	Multirole Fighter	220 [3]
Su-24 'Fencer'	Attack	220
Su-24M2 'Fencer'	Attack	3
Su-25 'Frogfoot-A'	Attack	190
Su-25SM 'Frogfoot-A'	Attack	3
Su-25T	Attack	2
Su-39	Attack	4
Su-34 'Fullback'	Attack	3
A-50 'Mainstay'	Airborne Early Warning	12
MiG-25R series 'Foxbat-B/D'	Reconnaissance	40
Su-24MR 'Fencer-E'	Reconnaissance	79
Tu-22MR 'Backfire'	Reconnaissance	10
An-26RTR 'Curl-B'	Elint	20
Su-24MP 'Fencer-F'	Elint	6

Transport – 61st Air Army

TYPE	ROLE	IN SERVICE
An-12BP 'Cub'	Transport	50
An-24 'Coke'	Transport	25
An-26 'Curl'	Transport	80
An-32 'Cline'	Transport	50
An-72 'Coaler'	Transport	20
An-74 'Coaler-B'	Transport	n/a [4]
An-22 'Cock'	Transport	2
An-124 'Condor'	Transport	11
Il-76 'Candid-B'	Transport	220 [5]
Il-76MF	Transport	2
Il-78 'Midas'	Tanker-Transport	9
Il-78M 'Midas'	Tanker-Transport	12

Other aircraft

Type	**Role**	**In Service**
L-39C Albatros	Trainer	300
MiG-25PU 'Foxbat-C'	Trainer	30 [4]
MiG-25RU 'Foxbat-C'	Trainer	10 [4]
MiG-29UB 'Fulcrum-B'	Trainer	100 [6]
MiG-29UBT 'Fulcrum-B'	Trainer	n/a [4]
Su-25UB 'Frogfoot-B'	Trainer	n/a [4]
Su-25UBM 'Frogfoot-B'	Trainer	n/a [4]
Su-27UB 'Flanker-C'	Trainer	50
Tu-95 'Bear-G'	Trainer	5
Tu-134UBL 'Crusty'	Crew Trainer	6
Tu-134BSh 'Crusty'	Crew Trainer	n/a [4]
An-30 'Clank'	Survey	30

Notes:

1. Including eight assigned to trials.
2. Two more expected to be delivered by end of 2008.
3. Up to 200 more in storage.
4. Quantity included in figure given elsewhere for different version.
5. Most operate with civilian identities, including Gosudarstvennaya Transportnaya Kompania Rossiya (Russian State Transport Company division of Aeroflot) with three Il-18s, 10 Il-62s, two Il-96s, eight Mi-8/17s, 10 Tu-134s, nine Tu-154s and nine Yak-40s.
6. Plus some 50 more in storage.

Source: Jane's World Air Forces

Short to medium term requirements and changes

Russia's Air Force is receiving more funds and political consideration in recent years. However, these positive elements cannot compensate for the dramatic decrease in effectiveness and efficiency of both equipment and personnel during the previous fifteen years.
Too many problems have been accumulated during the Nineties and early years of the new Century for being fixed quickly.

As far as the air defence is concerned, Russia's Air Force still relies on a large number of MiG-31 interceptors for covering the huge national territory.
These planes are the final outcome of the old fashioned design and operational philosophy dating back to the Sixties, when the need to protect the air space from intruding enemy bombers was paramount. Although the MiG-31s are capable planes, with very high top speed and relatively long range, their avionic system seems not adequate to face enemy strike aircraft with reduced radar cross sections or advanced (fourth generation) air superiority fighters.
Their role is therefore confined to the extended defence of Russian territory from old style and less plausible threats like enemy conventional (non-stealth) bombers.
However, due to the huge dimension of Russian territory, MiG-31s are expected to remain in service in significant number during next decade, since there is not any possibility to replace them with new aircraft.
The number of serviceable MiG-29 remains high, while a relevant number of these planes are probably on storage.
The original MiG-29 design was a capable fighter, able to outmanoeuvre western fighters of the same age thanks to a high effective aerodynamics, dedicated firing-control system and effective air-to-air missiles.
The drawbacks were a limited range and, more important, the almost inexistent attack capabilities against ground (or maritime) targets.
During the production, the original design has been improved, but most of Russia's fleet of MiG-29 is made of original MiG-29A and MiG-29C models.
Since late Eighties, Russian manufacturers started to develop advanced (or "modernised") MiG-29s. In 1986, the prototype of MiG-29M with an improved airframe and N010 Zhuk radar flew for the first time.
This model was presented during the 1994 Farnborough air show as MiG-33. However, the designation did not catch on and no buyer has been found for the aircraft.
For the next series of projects, which were designated 9-25 (or MiG-29M1 through M3), the designers planned to carry more fuel in a longer fuselage and to introduce canards and bigger wings. They also planned a new fire-control system, uprated engines and an in-flight refuelling probe. The last of the series was project 35, which - as MiG-35 - was announced as early as 1996. Later draft projects had engines spaced apart and a big conformal fairing for armament in-between. However, all plans to make deep changes in the airframe were eventually given up because of high costs with respect to expected results. So the MiG-35 has

emerged as a fighter that will retain the airframe from the MiG-29M2 prototype, with new avionics and weapons, as well as engines with thrust vectoring.[15]

Russia's MiG-29 'Fulcrum' fighter design gained a second lease of life when the Indian Navy placed an order in January 2004 for 16 ship borne MiG-29Ks for the aircraft carrier Admiral Gorshkov, plus an option for 30. More recently, Russia is offering India the "new" MiG-35 for the Indian program for 126 new fighters.

According to some estimates, Russia could also order a mid-life update for its fleet of MiG-29, introducing some of the features of the new models.

The Ministry of Defence has proposed the idea of adapting between 150 and 180 MiG-29s into multi-purpose night-time capable strikers that could perform interceptor and reconnaissance missions as well as deliver guided air-to-surface munitions.[16]

However, the age of Russia's MiG-29 fleet, coupled with the original limits in their expected lifespan, could substantially reduce the effectiveness of such a program. Also, while the avionic systems could be significantly rejuvenated, the operational concept that originated MiG-29's design could not. As a consequence, the "modernised" MiG-29 could improve Russia's Air Force ability to perform traditional air warfare, but could not support a significant update of air doctrine.

The Su-27 family of aircraft forms the most advanced and capable component of present Russia's Air Force.

Originally introduced into service during the Eighties, the Su-27 design was a potent air-superiority, long-range fighter with an enviable combat persistency, sophisticated avionics and excellent manoeuvrability.

Having at their disposal such a capable aircraft, the Russians have developed it into a whole family of combat aircraft. The development of the 'Flanker' runs along four lines, which sometimes correspond to each other but are generally becoming increasingly independent. The first line comprises production (for export) and minor modification of the base Su-27 and Su-30 aircraft. The second line includes the development of the modern, multi-role Su-35 fighter and its two-seat version, the Su-30MK (Su-35UB; MK stands for *modifitsirovannyi kommerchesky*, or modified commercial). The third line includes the shipborne Su-33 and Su-33UB. The fourth line relates to the Su-34 strike aircraft.[17]

Russia has procured very few examples of Su-30, Su-30M and Su-35 over the last decade. These planes played a significant role as test aircraft both for the integration of new avionic systems and for the elaboration of new concepts of operation.

In particular, the Su-30 was originally conceived as long-range fighter for the control of mixed Su-30 / Su-27 packages during extended combat air patrols. The more advanced avionics of Su-30, the presence of a "backseater" as weapon system officer and the dedicated data-links made able a single Su-30 to control a flight of Su-27 during interceptions, even without ground control assistance.

Therefore, a relatively small fleet of Su-30 could have replaced larger numbers of MiG-31s in the extended defence of Russia's air space.

The original project of Su-30 seems to have been abandoned, and the Su-30 design was then developed as multi-role fighter, retaining the long-range and combat persistence capacities of the Su-27, while adding increasing air-to-ground capabilities.

[15] "Russia aims to make MiG-35 fighter the pinnacle of 'Fulcrum' development", Jane's International Defense Review, January 2006

[16] Jane's World Air Forces

[17] "Dominance by design: the reign of Russia's 'Flankers'", Jane's Intelligence Review, November 1999

Over the last decade, the few Russia's Air Force Su-30s have been extensively exploited for the introduction of new electronic devices, further widening their capabilities in order to answer the requirements of foreign customers.
As a matter of fact, the export of Su-30s to India and China (Su-30MKI and Su-30 MKK) has provided Russia's defence manufacturers with a huge amount of revenues, thus allowing the very survival of Russian-borne aerospace industry.
More recently, Russia's Air Force is receiving back some of the resources invested during the previous decade in essentially export-driven developments.
On 27 December 2002, the first flight of the Russia's Air Force upgraded Su-27SM prototype from the KnAAPO factory at Komsomolsk-on-Amur signed the beginning of the modernization program of Russia's own Su-27 fleet. A second prototype aircraft was subsequently upgraded, with both prototypes subjected to factory tests before moving to the Russian Ministry of Defence's 929th Test Centre at Akhtubinsk for state acceptance trials.
The Su-27SM upgrade package uses upgrades previously developed for the two-seat Su-30MKK multirole fighter for China. The cockpit of Su-27SM has been equipped with two MFI-9 (7 x 5in) multi-function liquid crystal displays in a similar way to the Ramenskoye avionics design bureau's configuration for the Su-30MKK. A new radar computer and software makes it possible to use the R-77M (AA-12 'Adder') air-to-air missile, and also offers a terrain-mapping facility. The radar's resistance to jamming has been improved, and an A737 satellite navigation receiver has been installed.[18]
Su-27 upgrade program is now proceeding steadily but at relatively slow pace. It is estimated that between ten and twenty aircraft are updated every year.
Considering that the Russia's Su-27 have been originally delivered between 1985 and 1992, the fleet is today twenty-years old on average. Due to the reduced activity during the Nineties, most of the aircraft have probably logged a small number of flight hours. Therefore, if the current upgrade program includes also a structural upgrade, it seems likely the Su-27 will remain in service for at least twenty more years.[19]
In terms of effectiveness, the Su-27 are still today powerful planes, able to outmanoeuvre almost all western fighters in many air-to-air engagements.
However, their avionics is not as advanced as the last generation of Western fighters (EF-2000; Rafale), while Russian aircraft outclassed by US "air dominance fighter" F-22 Raptor.
In other terms, modernisation of the current fleet of Su-27 is probably a cost-effective solution for a partial upgrade of Russia's Air Force in the short term, but cannot provide Russia with a first-class capability beyond 2015.
Also, at the present pace of modernisation, only few dozen aircraft will be updated by 2015. After then, the rationale for further updating the Su-27 platforms would be highly questionable.

[18] "Russia's Su-27 modernisation moves forward", Jane's International Defense Review, January 2003
[19] By comparison, the Royal Air Force Tornado ground-attack planes were originally introduced in 1981 and after a deep upgrade program are expected to remain in service until 2020 at least. The Royal Air Force has a rate of utilisation of its Tornados that far exceeds that of Russia's Air Force for its Su-27s.

As for the ground-attack capabilities, present Russian fleet is based on Su-25 subsonic, clear-weather attack planes, optimised for close air-support and battlefield interdiction, and Su-24 supersonic long-range all-weather strike aircraft.
Both the designs are old, being originally introduced into service in XXXX and YYYY respectively.
However, some intrinsic features of these planes are still valuable, at least in the less-demanding scenarios of asymmetric conflicts.
The Su-25s are sturdy planes, highly survivable when the threat is essentially light weapons fire from the ground. It's penalised, however, by the basic avionic, which makes it unable to operate in bad weather or at night. Also, the type has not a precision-engagement capability in its original version.
For all these reasons, an updated SU-25 SM has been developed and combat-tested in Chechnya, where it seems to have been proved its qualities. The SU-25 SM should include a night-flight capability and the precision-targeting for laser-guided air-to-ground missiles and bombs.
However, due to the costs associated with this upgrades, at the moment there are not known plans for extending the upgrade program to more than a dozen of operational Su-25s.
The other ground-attack platform in Russia's Air Force inventory, the Su-24, is also a capable aircraft with huge payload and good operational range.
Its avionic systems allow the bad-weather operations, even at low level, and the radar-guided, computer-commanded release of offensive weapons.
However, the Su-24s lack the precision engagement capabilities that are now a common feature also in non-dedicated multirole fighters of Western origin.
In order to improve the capabilities of Su-24s, a limited upgrade of these planes has been recently launched. By the end of 2007, the Sukhoi manufacturer has delivered six upgraded Su-24M2 aircraft to Russia's Air Force units in Lipetsk (pilot combat training centre) and in an operational attack Regiment in the Far East.
The Su-24M2 have been equipped with improved cockpit with multifunction displays, helmet-mounted sights and a new advanced SVP-24 computer and associated software. All these upgrades should improve navigational precision and accuracy in the delivery of non-guided weapons.[20]
Both the extent of the upgrades and the number of aircraft involved so far seem to indicate that the Su-24M2 upgrade program is conceived as a short-term project for the prolongation of operational life of a batch of the existing Su-24s.
This assessment is also consistent with the average age of these aircraft which are close to ZZ years old.
The main program for the improvement of attack capabilities is certainly associated with the introduction of brand-new Su-34 (NATO codenamed "Fullback") strike planes.
The Su-34's design has evolved since the original drafts of mid-Eighties, adopting a side-by-side cockpit configuration. In the April of 1990 the fist prototype of the plane made the maiden flight, and the aircraft was thought to be a carrier-borne strike aircraft.

[20] "Russian Air Force receive 4 modernised tactical bombers", RIA Novisti, December, 25, 2007.

The first of what was then defined "series production" aircraft flew in 1994, but only four planes were produced by the 1997.
The severe shortage of funds delayed the construction of aircraft and the execution of trials, to the point that the completion of the first stage of trials was completed only in 2003, when the second phase begun, using a total of seven aircraft.
In recent years, the larger availability of funds increased the op-tempo of the trials, and the production run seems finally begun.
In December 2006, Sukhoi announced that 18 Su-34 would have been produced by 2010, while then Defence Minister Sergei Ivanov stated in March 2006 that the long-term production schedule included 58 aircraft by 2015.
In January 2008, Sukhoi representatives announced the beginning of full-scale production, with "up-to 20 planes per year" to be produced at Novosibirsk Aviation Production Association. The actual number of produced aircraft could however remain within the production schedule announced by the Defence Minister in 2006, with the announcement from Sukhoi aimed at the potential market outside Russia.
In technical terms, the Su-34 design present unique and impressive features.
The plane is definitely big and heavy, at around 45 Tons of maximum take-off weight.
The payload is also significantly high, estimated at 8 Tons, while the operational range should exceed 1,000 kilometres of combat radius in typical configuration and flight profile.
Externally, the most striking feature is certainly the side-by-side cockpit for the two crew members, so wide to present an aisle to rest during long-range flights, as well as a toilet.
Such a provisions are very uncommon among tactical aircraft, putting the Su-34 in a class on its own, in the middle between tactical fighter-bombers and strategic bombers.
The cockpit itself is also a sort of titanium-built tub protected by a 17 mm-thick armour.
Although these already known characteristics seem to answer operational requirements coming from real operations over Afghanistan and Chechnya during the last twenty years, a more accurate analysis could highlights several drawbacks of the Su-34 design.
First of all, the aircraft present an all but stealth design. Almost every detail of the frame seem to contribute to a very high radar cross-section. The air intakes are huge and very well visible from the front and below. They are likely unable to screen the fans of the engines, which contribute to the total RCS to a great extent.
The vertical rudders, the engine's exhausts, the extended tailcone are all examples of very un-stealthy designs. While last-generation stealth aircraft of US origins have devoted some space for the internal carriage of weapons, the Su-34 presents the traditional, external and non-conformal weapons carriage.
Giving these characteristics, it seems highly improbable that the Su-34's avionics could offer low-probability-of-intercept modes; the electronic counter-measures for self defence could be rather sophisticated, but will have to mask a huge radar (and thermal) signature.
There are not available details on the avionic systems for corroborating the hypothesis that the Su-34 is also a "platform-centric" aircraft, rather than a "network-centric" one. In other terms, the aircraft's design philosophy has tended to concentrate in the plane itself the capabilities for the effective engagement of targets, rather than relying on the mutual co-operation and exchange of information among different aircraft and other sensors.

For all these reasons, while the Su-34 looks impressive and a step forward the existing ground-attack aircraft, like Su-24 and Tornado, it is also the last development of previous-generation design.
It is questionable the level of survivability of such a design in a modern, high-tech scenario. If the new "Fullback" has been conceived as a platform for stand-off weapons, many of its expensive and design-constraining characteristics appear unnecessary.
Otherwise, if the aircraft has been conceived for hitting point-targets in bad weather, after long-range incursion in hostile airspace, it would necessarily require strong support from other platforms (air-superiority fighters; escort-jammers etc.) in any sophisticated theatre.
If Russia's Air Force will be able to deploy about sixty operational Su-34s by 2015, it will certainly have a better ability to fight a asymmetric warfare in and around the Federation's territory. However, the ability to project a significant air power far beyond national borders, against modern-equipped enemies, will remain rather low.

The new generation Russia's tactical fighter

Although deeply affected by the lack of resources, during the early years of this decade Russia's Air Force authorities launched the program for a new generation fighter aircraft, conceived as the Russian equivalent of American F-22 and F-35 aircraft.
After a technical comparison between MiG 1.42 and Sukhoi S-37/Su-47 designs, the latter firm was finally selected, although a substantial participation of MiG engineering is also expected.
The new aircraft project has the Air Force name of PAK FA (*Perspektivnyi Aviatsionnyi Kompleks Frontovoi Aviatsii*, prospective aviation complex for frontal aviation). The Sukhoi's project name is T-50.
As the definition suggests, it is a tactical aircraft, which should replace both the MiG-29 and Su-27 family of airplanes in Russia's Air Force fleet.
Original timetable for PAK FA realization envisioned a first flight of a prototype in 2006, and the beginning of production run in 2010.
As of the end of 2007, the first flight didn't occur and is now planned for 2008 of more likely for 2009. The beginning of deliveries to operational units is expected not before 2015, thus the initial operational capability should not be achieved before 2018 at earliest.
Taking into account the aim of the present analysis, the PAK FA program should not be included among the capabilities that Russia's Armed Forces will operationally deploy in the medium term.
However, the project offers significant hints to the developing capabilities of Russia's military, in terms of procurement on new-generation weapon systems.
At the moment, there are not public drawings of the new plane, but there is a general consensus among the analysts on the relatively conventional nature of the new aircraft.
The T-50 is believed to be a 20-Tonns maximum take-off weight plane, that is something in the middle between the MiG-29 and Su-27. It should present the traditional (for Russian projects) super-manoeuvrability of the latest Russia's fighter and probably a super-cruise capability. It is also expected to offer a reduced radar cross-section, although it seems highly unlikely the Russian have the ability to realize a stealth fighter as the F-22 or the F-35.

At the August Moscow air show (MAKS 2007), some details of the T-50 were revealed, particularly the new X-band radar and some of the new air-to-surface missiles the aircraft will utilize.
Also, it was revealed that two leading aero-engine houses, NPO Saturn and MMPP Salut, were competing for the realization of the T-50 engines.
It seems therefore that the envisaged time schedule is probably optimistic, and a lot of integration work should follow the construction and first flight of the prototype, which will be probably equipped with many provisional systems, both in the powerplant and in the avionic.
The other crucial aspect of the PAK FA / T-50 is the cost of the program.
According to industrial sources, by mid-2005 the Sukhoi manufacturer had invested 100 million dollars in the project. This is an extremely low level of funding for such an ambitious project.[21]
By the same date, the investments required for the initial development of critical items was estimated at 1.5 billion dollars.
A major breakthrough in the funding problems could be the agreement reached in October 2007 by Russian and Indian authorities, for the joint development and production of the plane. At that tome, Sukhoi officials said the development cost of the new aircraft would have been "at least 10 billion dollars".[22] The bi-national agreement called for the equal financing of the development.
A development cost in the region of ten billion dollars seems still an underestimation.
By comparison, the Joint Strike Fighter project, which will probably deliver a much more advanced aircraft but is run during the same timeframe, is estimated at more than 40 billion dollars for the development only.
The decision to share with India the development of the new fighter also generates problems. India does not possess advanced technical capabilities in the aerospace sector. While India will be probably able to sustain the joint project financially, it will not contribute significantly in terms of technology. But, according to the past experiences of Indian-borne projects, Indian industry and government will push for a substantial involvement in the technological development associated with an advanced weapon system. This will probably slow-down the already sluggish PAK FA project.
However, if Russia will have to finance half of the T-50 development during the next seven years (2008 – 2014), this will require non less than 1 billion dollars per year, probably much more.
These money will inevitably reduce the available resources for the modernisation of the existing fleet. Therefore, although the in-service date is planned after the 2015, the PAK FA / T-50 program is going to deeply affect Russia's Air Force capability in the short to medium term.

[21] "Russia's PAKFA fighter project faces funding problems", Jane's Defence Industry, March 2006
[22] "India, Russia sign deal to develop fifth-gen fighter", Jane's Defence Weekly October 24, 2007

Russia's Defence Expenditure

Any analysis of the expected trend of Russia's military power over the medium term cannot avoid to deal with the amount of financial resources the armed forces will enjoy.
Actually, the evaluation of Soviet and then Russian defence expenditure has been traditionally hampered by lack of official information, or at least by the inconsistency of those provided.
It is widely known that a substantial proportion of Russia's defence expenditure lays outside the official defence budget, while other, non strictly military expenditures are included.
On top of this, the common problem of accurately evaluate a non Western public expenditure is caused by the difficult in assessing the real purchase power parity, that is the actual economic power of the available money.
As a consequence, various estimates are currently used in the literature, providing sometimes rather different pictures of Russia's military expenditure.

This is the comparison of different non-Russian and Russian sources on Russia's defence expenditure during the last 13 years:[23]

[23] Mikhail A. Lukin (Kommersant) special for Moscow Defense Brief

Dynamics of Russian State Defence Procurement

Foreign estimates

Year	US Department of State	US Arms Control and Disarmament Agency		Independent Analytical Agencies		
	in current prices ($ mln)	estimates of 1996, in current prices ($ mln)	estimates of 1998, in current prices ($ mln)	SIPRI ($ mln of 2003)	CDI and Center for Arms Control & Non-Proliferation, in current prices ($ mln)	IISS, in current prices ($ mln)
1992	64 000	159 200	71 300	27 159		
1993	55 900	125 000	62 400	23 958		
1994	55 200	93 000	61 700	23 172		
1995	37 700	76 000	40 900	14 700		
1996	34 700		37 700	13 300		
1997	39 300		41 700	14 300	64 000	
1998	28 400			10 300	55 000	
1999	35 000			12 300	56 000	
2000				14 200	60 000	
2001				15 700	65 000	44 813
2002				16 900	50 800	48 040
2003				18 500	65 200	
2004				19 400	61 900	
2005						
2006						

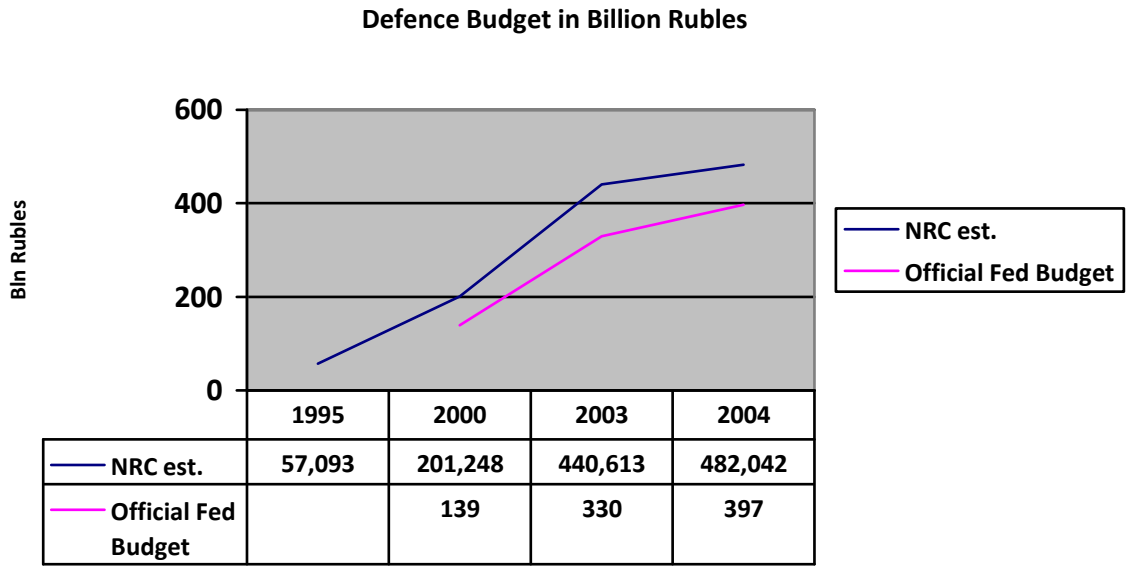
Russian data

Year	Planned military expenses		Real military expenses	
	Planned expenses for national defense in state budget ($ mln)	Share in planned state budget expenses	Real expenses for national defense ($ mln)	Share in real state budget expenses
1992	2 517	21.56%		
1993	3 328	16.64%		
1994	18 085	20.89%		
1995	10 656	19.56%		
1996	15 368	18.4%		
1997	18 028	19.69%	13 772	19.47%
1998	8 352	16.35%	5 792	14.58%
1999	3 801	16.29%	4 711	17.47%
2000	5 007	16.47%	6 816	18.81%
2001	7 357	17.99%	8 489	18.74%
2002	9 061	14.59%	9 444	14.42%
2003	11 233	14.69%	11 278	14.67%
2004	14 282	15.47%	14 944	15.74%
2005	18 801	17.43%	20 726	16.34%
2006	23 660	15.6%		

The amounts are calculated based on average annual rate of exchange

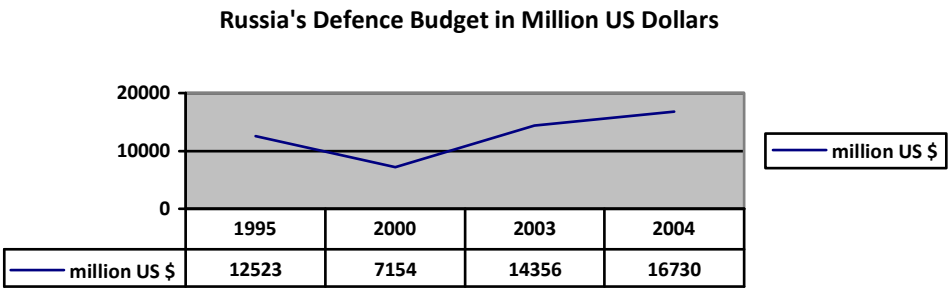
This is another comparison, between data provided by NATO-Russia Council[24] and those provided by Russian financial authorities:

	1995	2000	2003	2004
Current prices, million Rubles 482,042 (NATO-Russia Council Est.)	57,093	201,248	440,613	
Federal Budget, national defence Billions Rubles (Russia's Ministry of Finance)	--	139	330	397
Current prices, million US dollars current exchange rates (NATO-Russia Council Est.)	12,523	7,154	14,356	16,730
Per capita expenditure in US $ 2000 prices and exchange rates (NATO-Russia Council Est.)	65	49	70	64



Graphic elaboration: A. Grazioso

[24] "NATO Russia compendium of financial and economic data relating to defence", NATO 2007



Graphic elaboration: A. Grazioso

Finally, this is the most consistent estimate on the recent trend in Russia's defence budget, provided by Jane's Sentinel:[25]

	2001	2002	2003	2004	2005	2006	2007
RUR (billions)	214	322	442	494	589	658	821
USD (billions)	7.36	10.26	14.41	17.15	20.83	24.22	31.56

US dollar conversions use an annualised interbank rate for the relevant year

Of course, the absolute amount of expenditure in defence activities should be better assessed in connection with the actual national wealth, expressed as Gross Domestic Product:

The World Bank Estimate of Russia's GDP

	2001	2002	2003	2004	2005	2006
GDP	306,602,672,128	345,470,500,864	431,487,025,152	591,742,435,328	764,501,426,176	986,939,588,608

In current US$

[25] Jane's Sentinel Security Assessment - Russia And The CIS, July 31, 2007

The data provided in CIA's World Factbooks are different:

Russia's Gross Domestic Product (GDP)
in US Dollars
(CIA World Factbook)

Year	GDP
1999	$620.3 billion
2000	$1.120 trillion
2002	$1.409 trillion
2003	$1.282 trillion
2004	$1.408 trillion
2005	$1.584 trillion
2006	$1.723 trillion

Using the figures from NATO-Russia Council,[26] further information can be retrieved in terms of trends both for GDP and Defence Expenditure:

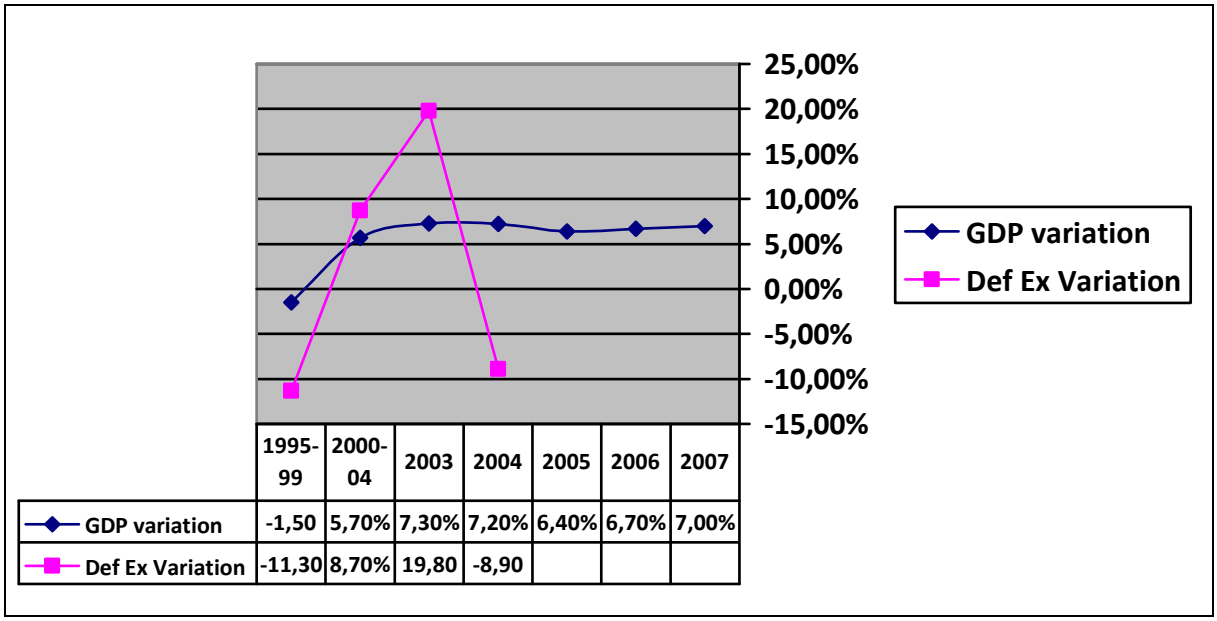
Russia's Gross Domestic Product (GDP)
annual variation

	1995-99	2000-04	2003	2004	2005	2006	2007
Average variation	-1.5%	5.7%	7.3%	7.2%	6.4%	6.7%	7.0%

Russia's Defence Expenditure
annual variation

	1995-99	2000-04	2003	2004	2005	2006	2007
Average variation	-11.3%	8.7%	19.8%	-8.9%	--	--	--

[26] See note 2



	1995-99	2000-04	2003	2004	2005	2006	2007
GDP variation	-1,50	5,70%	7,30%	7,20%	6,40%	6,70%	7,00%
Def Ex Variation	-11,30	8,70%	19,80	-8,90			

Source: NATO – Russia compendium of financial data relating to defence
Graphic elaboration: A. Grazioso

As for the above data, it seems that Russian Defence budget follows the general trend of Russian GDP, but it also strongly accentuates the year-by-year variation. Probably, this happens because in the national budget the military expenditures remain relatively more flexible and discretionary than other public expenditures.

However, using the more consistent and updated series of Jane's Sentinel,[27] the incidence of Defence expenditure on Russian national wealth seems relatively stable during the last seven years:

National Defence Budget	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
% of GDP	2.40	2.97	3.34	2.90	2.72	2.47	2.63

If the defence expenditure follows – as usually happen – the trend of national GDP, the rapid increase in Russia military expenditure should be linked primarily to the same causes that are positively affecting Russian economy.

It is widely known that Russia's economy is heavily dependent on oil and natural gas exports, making it vulnerable to fluctuations in world oil prices.

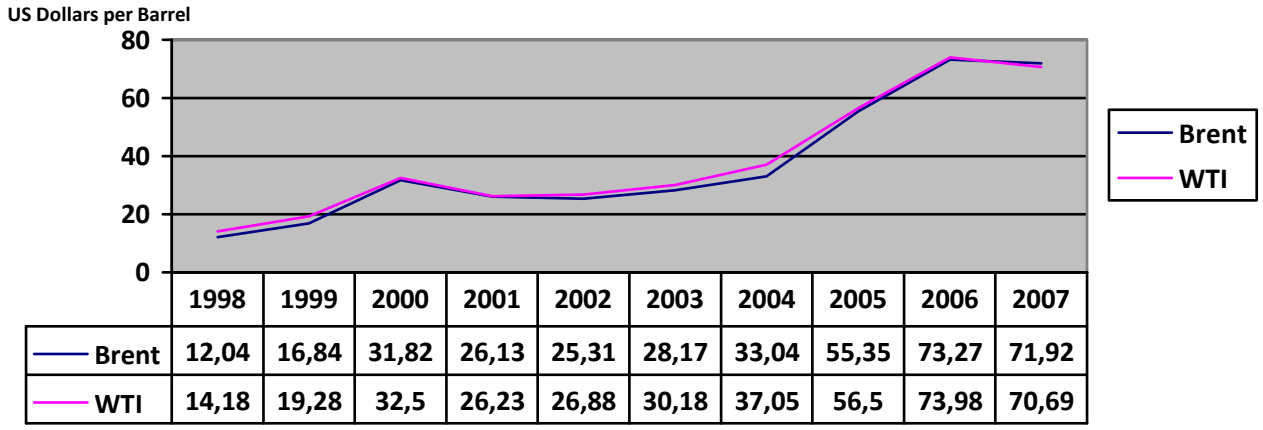
[27] See note 3

According to an International Monetary Fund (IMF) study ,[28] a $1 per barrel increase in Urals blend oil prices for a year is estimated to raise federal budget revenues by 0.35 percent of GDP, or $3.4 billion.

This is the evolution of international prices for crude oil, during the last decade:[29]

Date	Brent (US. Dollars Per Barrel)	WTI at Cushing (U.S. Dollars Per Barrel)
6/30/98	12.04	14.18
6/30/99	16.84	19.28
6/30/00	31.82	32.50
6/29/01	26.13	26.23
6/28/02	25.31	26.88
6/30/03	28.17	30.18
6/30/04	33.04	37.05
6/30/05	55.35	56.50
6/30/06	73.27	73.98
6/29/07	71.92	70.69

[28] *Antonio Spilimbergo* "Measuring the Performance of Fiscal Policy in Russia" IMF Working Paper
[29] The Wall Street Journal



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Brent	12,04	16,84	31,82	26,13	25,31	28,17	33,04	55,35	73,27	71,92
WTI	14,18	19,28	32,5	26,23	26,88	30,18	37,05	56,5	73,98	70,69

Graphic elaboration: A. Grazioso

According to these date, oil prices more than doubled between 2004 and 2007 (about + 118%) Over the same period, World Bank estimate of Russia's GDP substantially increased, from 591 to 986 Billion US Dollars (about + 66%).
Using Jane's data, between 2004 and 2007 Russia's Defence Budget increased from 494 to 821 Billion Rubles (about + 66%), and from 17.15 to 31.56 billion US Dollars (about + 82%).

According to these data, Russian Defence Budget follows the same trend of Russian GDP, when calculated in national currency, while it has an higher increase when calculated in US Dollars.
However, these increases remain below the variation of crude oil prices over the same period.

In order to make an estimation of Russian Defence expenditure in the near future, it is paramount to assess the probable trend of Russian Economy at a whole.

This is the Economist Intelligence Unit estimate for Russia:[30]

Key indicators	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Real GDP growth (%)	7.2	6.4	5.5	4.8	4.5	4.3
Consumer price inflation (av; %)	8.6	9.0	7.7	7.2	6.7	6.3
Budget balance (% of GDP)	4.0	0.8	0.7	0.8	1.0	1.0
Exchange rate Rb:US$ (av)	25.7	25.1	26.0	26.3	27.0	27.5
Exchange rate Rb:€(av)	34.9	36.2	34.5	33.6	34.0	34.4

Hypothesis on Russia's future military expenditure

Using the abovementioned data for the calculation of Russia's GDP / Defence Budget ratio, and the EIU's estimates on Russia's future growth, in 2012 Russia's defence budget could be

Key Indicators	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Real GDP growth (%)		7.2	6.4	5.5	4.8	4.5	4.3
GDP estimate Bn US$	984.6 (a)	1050	1125	1197	1262	1322	1381
Def. Budget estimate Bn US$							
at 2.7% of GDP	24.22 (a)	28.35	30.37	32.31	34.07	35.69	37.28
at 3.3% of GDP	---	34.65	37.12	39.50	41.64	43.62	45.57

According to these estimates, Russia's military could have available between 159.61 Bn and 207.45 Bn US Dollars over the 2008-2012 timeframe.

According to a Russian analyst,[31] the "State Program for Armaments 2007-2015" allocates 190 Billion US Dollars , of which the Defence Ministry should provide $173.5 billion, including $109.2 Billion for the purchase of new arms and equipment at constant 2006 prices.

These figure seems rather optimistic, since it refers to the procurement + R&D expenditure, which is only a fraction of the total expenditure.

[30] The Economist Intelligence Unit – Country Profile – Russia, September 2007
[31] Andrei Frolov, "Russian Defence Procurement in 2007", Centre for Analysis of Strategies and Technologies (CAST), Moscow

According to the same source,[32] in 2007 the National Defence Procurement amounted to 302.7 Bn Rubles, that is about 36.7% of the Defence Budget.

If the share of military procurement on the total budget will remain almost constant in the short term – a likely event due to the increasing costs of recruitment of contract personnel that will probably drain the expected increases of the budget – the available resources for procurement (including acquisition of new equipment, repairs and modernisation of the existing stocks and R&D, should be comprised between 58.5 Bn US$ and 76.13 Bn US$ in the 2008-2012 period.

[32] See note 31

SUBMARINES - Strategic	TYPHOON (AKULA) CLASS (PROJECT 941/941U) (SSBN)	ARKHANGELSK (TK 17)	828	Severodvinsk	24 Feb 1985	Aug 1986	6 Nov 1987
SUBMARINES - Strategic	TYPHOON (AKULA) CLASS (PROJECT 941/941U) (SSBN)	SEVERSTAL (TK 20)	806	Severodvinsk	6 Jan 1986	July 1988	4 Sep 1989
SUBMARINES - Strategic	TYPHOON (AKULA) CLASS (PROJECT 941/941U) (SSBN)	DMITRIY DONSKOY (TK 208)	824	Severodvinsk	30 June 1976	23 Sep 1979	12 Dec 1981
SUBMARINES - Strategic	DELTA IV (DELFIN) CLASS (PROJECT 667BDRM) (SSBN)	VERCHOTURE (K 15)	800	Severodvinsk	23 Feb 1981	Jan 1984	29 Dec 1984
SUBMARINES - Strategic	DELTA IV (DELFIN) CLASS (PROJECT 667BDRM) (SSBN)	EKATERINBURG (K 84)	807	Severodvinsk	Nov 1983	Dec 1984	Feb 1985
SUBMARINES - Strategic	DELTA IV (DELFIN) CLASS (PROJECT 667BDRM) (SSBN)	TULA (K 114)	805	Severodvinsk	Dec 1985	Sep 1986	Jan 1987
SUBMARINES - Strategic	DELTA IV (DELFIN) CLASS (PROJECT 667BDRM) (SSBN)	BRIANSK (K 117)	820	Severodvinsk	Sep 1986	Sep 1987	Mar 1988
SUBMARINES - Strategic	DELTA IV (DELFIN) CLASS (PROJECT 667BDRM) (SSBN)	KARELIA (K 18)	839	Severodvinsk	Sep 1987	Oct 1989	Sep 1989
SUBMARINES - Strategic	DELTA IV (DELFIN) CLASS (PROJECT 667BDRM) (SSBN)	NOVOMOSKOVSK (K 407)	849	Severodvinsk	Nov 1988	14 Feb 1990	1991
SUBMARINES - Strategic	DELTA III (KALMAR) CLASS (PROJECT 667BDR) (SSBN)	BORISOGLEBSK (K 496)	864	Severodvinsk	23 Feb 1977	Aug 1977	Apr 1978
SUBMARINES - Strategic	DELTA III (KALMAR) CLASS (PROJECT 667BDR) (SSBN)	RYAZAN (K 44)	862	Severodvinsk	May 1978	Sep 1978	Aug 1979
SUBMARINES - Strategic	DELTA III (KALMAR) CLASS (PROJECT 667BDR) (SSBN)	ZELENOGRAD (K 506)	912	Severodvinsk	Sep 1978	Mar 1979	Nov 1979
SUBMARINES - Strategic	DELTA III (KALMAR) CLASS (PROJECT 667BDR) (SSBN)	PETROPAVLOVSK KAMCHAT	938	Severodvinsk	Apr 1979	Dec 1979	Aug 1980
SUBMARINES - Strategic	DELTA III (KALMAR) CLASS (PROJECT 667BDR) (SSBN)	SYVATOY GIORGIY POBEDO	993	Severodvinsk	Apr 1980	Nov 1980	Aug 1981
SUBMARINES - Strategic	BOREY CLASS (PROJECT 9	(5 planned)					
SUBMARINES - Strategic	BOREY CLASS (PROJECT 955) (SSBN)	YURI DOLGORUKY		Sevmashpred	2 Nov 1996	15 Apr 2007	2008
SUBMARINES - Strategic	BOREY CLASS (PROJECT 955) (SSBN)	ALEXANDER NEVSKY		Sevmashpred	19 Mar 2004	2008	2009
SUBMARINES - Strategic	BOREY CLASS (PROJECT 955) (SSBN)	VLADIMIR MONOMACH		Sevmashpred	19 Mar 2006	2010	2011
SUBMARINES - Attack S	OSCAR II (ANTYEY) (PROJECT 949B) (SSGN)	VORONEZH (K 119)	812	Severodvinsk	Nov 1985	Dec 1988	1989
SUBMARINES - Attack S	OSCAR II (ANTYEY) (PROJECT 949B) (SSGN)	SMOLENSK (K 410)	816	Severodvinsk	Aug 1986	Jan 1990	Dec 1990
SUBMARINES - Attack S	OSCAR II (ANTYEY) (PROJECT 949B) (SSGN)	CHELIABINSK (K 442)	904	Severodvinsk	Mar 1987	June 1990	13 May 1991
SUBMARINES - Attack S	OSCAR II (ANTYEY) (PROJECT 949B) (SSGN)	VILYACHINSK (K 456)	920	Severodvinsk	1988	1990	1991
SUBMARINES - Attack S	OSCAR II (ANTYEY) (PROJECT 949B) (SSGN)	OREL (K 266) (ex-Severodvins	847	Severodvinsk	Dec 1988	May 1992	Jan 1993
SUBMARINES - Attack S	OSCAR II (ANTYEY) (PROJECT 949B) (SSGN)	OMSK (K 186)	947	Severodvinsk	1991	May 1993	15 Dec 1993
SUBMARINES - Attack S	OSCAR II (ANTYEY) (PROJECT 949B) (SSGN)	TOMSK (K 150)	902	Severodvinsk	Aug 1991	18 July 1996	12 Aug 1997
SUBMARINES - Attack S	YASEN CLASS (PROJECT 885) (SSN/SSGN)	SEVERODVINSK (K 329)		Severodvinsk	21 Dec 1993	2007	2008
SUBMARINES - Attack S	AKULA (BARS) CLASS (PROJECT 971/971U/09710) (SSN)	KASHALOT (K 322)	985	Komsomolsk S	1983	1985	1986
SUBMARINES - Attack S	AKULA (BARS) CLASS (PROJECT 971/971U/09710) (SSN)	MAGADAN (K 331) (ex-Narwha	997	Komsomolsk S	1984	1986	1990
SUBMARINES - Attack S	AKULA (BARS) CLASS (PROJECT 971/971U/09710) (SSN)	PANTERA (K 317)	878	Severodvinsk	Nov 1986	May 1990	30 Dec 1990
SUBMARINES - Attack S	AKULA (BARS) CLASS (PROJECT 971/971U/09710) (SSN)	VOLK (K 461)	867	Severodvinsk	1986	11 June 1991	30 Dec 1991
SUBMARINES - Attack S	AKULA (BARS) CLASS (PROJECT 971/971U/09710) (SSN)	KUZBASS (K 419) (ex-Morzh)	951	Komsomolsk S	1984	1989	1991
SUBMARINES - Attack S	AKULA (BARS) CLASS (PROJECT 971/971U/09710) (SSN)	LEOPARD (K 328)	872	Severodvinsk	Oct 1988	28 July 1992	Dec 1992
SUBMARINES - Attack S	AKULA (BARS) CLASS (PROJECT 971/971U/09710) (SSN)	TIGR (K 154)	853	Severodvinsk	1989	10 June 1993	Dec 1993
SUBMARINES - Attack S	AKULA (BARS) CLASS (PROJECT 971/971U/09710) (SSN)	SAMARA (K 295) (ex-Dragon)	970	Komsomolsk S	1985	15 July 1994	29 July 1995
SUBMARINES - Attack S	AKULA (BARS) CLASS (PROJECT 971/971U/09710) (SSN)	NERPA (K 152)		Komsomolsk S	1986	24 June 2006	2007
SUBMARINES - Attack S	AKULA (BARS) CLASS (PROJECT 971/971U/09710) (SSN)	VEPR (II) (K 157)	890	Severodvinsk	1991	10 Dec 1994	Dec 1995

SUBMARINES - Attack S	AKULA (BARS) CLASS (PROJECT 971/971U/09710) (SSN)	GEPARD (II) (K 335)	835	Severodvinsk	1991	18 Aug 1999	29 July 2001
SUBMARINES - Attack S	SIERRA II (KONDOR) CLASS (PROJECT 945B) (SSN)	PSKOV (K 336) (ex-Okun)	663	Nizhny Novgo	May 1990	June 1992	12 Aug 1993
SUBMARINES - Attack S	SIERRA II (KONDOR) CLASS (PROJECT 945B) (SSN)	NIZHNY NOVGOROD (K 534)	602	Nizhny Novgo	June 1986	June 1988	28 Dec 1990
SUBMARINES - Attack S	SIERRA I (BARRACUDA) CLASS (PROJECT 945) (SSN)	KOSTROMA (K 276) (ex-Krab)	648	Nizhny Novgo	8 May 1982	29 June 1983	21 Sep 1984
SUBMARINES - Attack S	VICTOR III (SCHUKA) CLASS (PROJECT 671 RTMK) (SSN)	SNEZHNOGORSK (B 388) (ex	654	Admiralty, Ler	8 Sep 1987	3 June 1988	30 Nov 1988
SUBMARINES - Attack S	VICTOR III (SCHUKA) CLASS (PROJECT 671 RTMK) (SSN)	OBNINSK (B 138)	618	Admiralty, Ler	7 Dec 1988	5 Aug 1989	10 May 1990
SUBMARINES - Attack S	VICTOR III (SCHUKA) CLASS (PROJECT 671 RTMK) (SSN)	DANIL MOSKOVSKIY (B 414)	684	Admiralty, Ler	1 Dec 1988	31 Aug 1990	30 Dec 1990
SUBMARINES - Attack S	VICTOR III (SCHUKA) CLASS (PROJECT 671 RTMK) (SSN)	TAMBOV (B 448)	661	Admiralty, Ler	31 Jan 1991	17 Oct 1991	24 Sep 1992
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	RAZBOYNIK (B 260)	504	Komsomolsk S	Sep 1980	19 Aug 1981	Dec 1981
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	TUR (B 227)	469	Komsomolsk S	Sep 1981	Sep 1982	Dec 1982
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	VOLOGDA (B 402)	405	Nizhny Novgo	Feb 1983	1984	27 Dec 1984
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	B 806	487	Nizhny Novgo			1986
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	B 439	545	Komsomolsk S	1985	1985	1986
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	B 445		Komsomolsk S	1986	1987	Dec 1987
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	JAROSLAVL (B 808)	425	Nizhny Novog			1988
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	B 394		Komsomolsk Shipyard			Dec 1988
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	KALUGA (B 800)	409	Nizhny Novgorod			1989
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	UST-KAMSHATSK (B 464)	547	Komsomolsk S	1988	1988	1989
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	NOVOSIBIRSK (B 401)	440	Nizhny Novgo	June 1988	Aug 1989	4 Jan 1990
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	MAGNETO-GORSK (B 471)	448	Nizhny Novgo			1990
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	UST-BOLSHERETSK (B 494)	549	Komsomolsk S	1989	1990	1990
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	VLADIKAVKAZ (B 459, ex-B 43	431	Nizhny Novgorod			1990
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	ALROSA (B 781)	554	Nizhny Novgo	May 1998	Aug 1989	Dec 1990
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	LIPETSK (B 177)	429	Nizhny Novgorod			1991
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	B 187	529	Komsomolsk S	1990	1990	1991
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	B 190	521	Komsomolsk S	8 May 1992	1993	1993
SUBMARINES - Patrol St	KILO CLASS (PROJECT 877K/877M/636) (SSK)	B 345	507	Komsomolsk S	22 Apr 1993	1993	22 Jan 1994
SUBMARINES - Patrol St	LADA CLASS (PROJECT 677) (SSK)	SAINT PETERSBURG		Admiralty, St P	26 Dec 1997	28 Oct 2004	2007
SUBMARINES - Patrol St	LADA CLASS (PROJECT 677) (SSK)	KRONSHTADT		Admiralty, St P	28 July 2005	2007	2009
SUBMARINES - Patrol St	LADA CLASS (PROJECT 677) (SSK)	SEVASTOPOL		Admiralty, St P	10 Nov 2006	2009	2011
SUBMARINES - Patrol St	TANGO (SOM) (PROJECT 641B) CLASS (SSK)	B 380	572				
SUBMARINES - Auxiliary	DELTA III STRETCH (PROJECT 667 BDR) (SSAN)	ORIENBURG K 129		Severodvinsk	Feb 1979	Mar 1981	5 Nov 1981
SUBMARINES - Auxiliary	UNIFORM (KACHALOT) CLASS (PROJECT 1910) (SSAN)		AS 15	Sudomekh, Leningrad		25 Nov 1982	31 Dec 1986
SUBMARINES - Auxiliary	UNIFORM (KACHALOT) CLASS (PROJECT 1910) (SSAN)		AS 16	Sudomekh, Leningrad		29 Apr 1988	30 Dec 1991
SUBMARINES - Auxiliary	UNIFORM (KACHALOT) CLASS (PROJECT 1910) (SSAN)		AS 17	Sudomekh, St Petersburg		26 Aug 1995	Feb 1998
SUBMARINES - Auxiliary	PALTUS/X-RAY (PROJECT 1851/10831) CLASS (SSAN/SSA)		AS 23				

SUBMARINES - Auxiliary	PALTUS/X-RAY (PROJECT 1851/10831) CLASS (SSAN/SSA)		AS 35				
SUBMARINES - Auxiliary	PALTUS/X-RAY (PROJECT 1851/10831) CLASS (SSAN/SSA)		AS 21 (X-Ray)				
AIRCRAFT CARRIERS	KUZNETSOV (OREL) CLASS (PROJECT 1143.5/6) (CVGM)	ADMIRAL KUZNETSOV (ex-Tb	063	Nikolayev Sou	1 Apr 1982	16 Dec 1985	25 Dec 1990
BATTLE CRUISERS	KIROV (ORLAN) CLASS (PROJECT 1144.1/1144.2) (CGHMN	PYOTR VELIKIY (ex-Yuri Andr	099 (ex-183	Baltic Yard 18	11 Mar 1986	29 Apr 1989	9 Apr 1998
CRUISERS	SLAVA (ATLANT) CLASS (PROJECT 1164) (CGHM)	MOSKVA (ex-Slava)	121	Nikolayev Nor	5 Nov 1976	27 July 1979	30 Dec 1982
CRUISERS	SLAVA (ATLANT) CLASS (PROJECT 1164) (CGHM)	MARSHAL USTINOV	055	Nikolayev Nor	5 Oct 1978	25 Feb 1982	15 Sep 1986
CRUISERS	SLAVA (ATLANT) CLASS (PROJECT 1164) (CGHM)	VARYAG (ex-Chervona Ukrain	011	Nikolayev Nor	31 July 1979	28 Aug 1983	25 Dec 1989
CRUISERS	KARA (BERKOT-B) CLASS (PROJECT 1134B) (CGHM)	KERCH	713 (ex-711	Nikolayev Nor	30 Apr 1971	21 July 1972	25 Dec 1974
DESTROYERS	UDALOY II (FREGAT) CLASS (PROJECT 1155.1) (DDGHM)	ADMIRAL CHABANENKO	650 (ex-437	Yantar, Kalinir	30 Apr 1971	21 July 1972	26 Dec 1974
DESTROYERS	UDALOY (FREGAT) CLASS (PROJECT 1155) (DDGHM)	MARSHAL VASILEVSKY	687	Yantar, Kalinir	22 Apr 1979	29 Dec 1981	8 Dec 1983
DESTROYERS	UDALOY (FREGAT) CLASS (PROJECT 1155) (DDGHM)	ADMIRAL TRIBUTS	564	Zhdanov Yard	19 Apr 1980	26 Mar 1983	30 Dec 1985
DESTROYERS	UDALOY (FREGAT) CLASS (PROJECT 1155) (DDGHM)	MARSHAL SHAPOSHNIKOV	543	Yantar, Kalinir	8 May 1983	30 Dec 1984	30 Dec 1985
DESTROYERS	UDALOY (FREGAT) CLASS (PROJECT 1155) (DDGHM)	SEVEROMORSK (ex-Simferop	619	Yantar, Kalinir	12 June 1984	24 Dec 1985	30 Dec 1987
DESTROYERS	UDALOY (FREGAT) CLASS (PROJECT 1155) (DDGHM)	ADMIRAL LEVCHENKO (ex-Kh	605	Zhdanov Yard	27 Jan 1982	21 Feb 1985	30 Sep 1988
DESTROYERS	UDALOY (FREGAT) CLASS (PROJECT 1155) (DDGHM)	ADMIRAL VINOGRADOV	572	Yantar, Kalinir	5 Feb 1986	4 June 1987	30 Dec 1988
DESTROYERS	UDALOY (FREGAT) CLASS (PROJECT 1155) (DDGHM)	ADMIRAL KHARLAMOV	678	Yantar, Kalinir	7 Aug 1986	29 June 1988	30 Dec 1989
DESTROYERS	UDALOY (FREGAT) CLASS (PROJECT 1155) (DDGHM)	ADMIRAL PANTELEYEV	548	Yantar, Kalinir	28 Apr 1988	7 Feb 1990	19 Dec 1991
DESTROYERS	SOVREMENNY (SARYCH) CLASS (PROJECT 956/956A) (DD	BURNY	778	Zhdanov Yard	4 Nov 1983	30 Dec 1986	30 Sep 1988
DESTROYERS	SOVREMENNY (SARYCH) CLASS (PROJECT 956/956A) (DD	GREMYASHCHY	404 (ex-429	Zhdanov Yard	23 Nov 1984	30 May 1987	14 Jan 1989
DESTROYERS	SOVREMENNY (SARYCH) CLASS (PROJECT 956/956A) (DD	BYSTRY	715	Zhdanov Yard	29 Oct 1985	28 Nov 1987	30 Sep 1989
DESTROYERS	SOVREMENNY (SARYCH) CLASS (PROJECT 956/956A) (DD	RASTOROPNY	420	Zhdanov Yard	15 Aug 1986	4 June 1988	30 Dec 1989
DESTROYERS	SOVREMENNY (SARYCH) CLASS (PROJECT 956/956A) (DD	BEZBOYAZNENNYY	754	Zhdanov Yard	8 Jan 1987	18 Feb 1989	28 Nov 1990
DESTROYERS	SOVREMENNY (SARYCH) CLASS (PROJECT 956/956A) (DD	BESPOKOINY	620	Zhdanov Yard	18 Apr 1987	22 Feb 1992	29 Dec 1993
DESTROYERS	SOVREMENNY (SARYCH) CLASS (PROJECT 956/956A) (DD	NASTOYCHIVY (ex-Moskowsk	610	Zhdanov Yard	7 Apr 1988	June 1992	27 Mar 1993
DESTROYERS	SOVREMENNY (SARYCH) CLASS (PROJECT 956/956A) (DD	ADMIRAL USHAKOV (ex-Bess	434	Zhdanov Yard	16 Apr 1988	30 Dec 1993	17 Apr 1994
DESTROYERS	KASHIN (PROJECT 61) CLASS (DDGM)	SMETLIVY	810	Nikolayev Nor	15 July 1966	26 Aug 1967	25 Sep 1969
FRIGATES	GROM CLASS (PROJECT 1244.1) (FFG)	BORODINO (ex-Novik)		Yantar, Kalinir	26 July 1997	2001	2008
FRIGATES	NEUSTRASHIMY (JASTREB) CLASS (PROJECT 1154) (FFGI	NEUSTRASHIMY	712	Yantar, Kalinir	25 Mar 1987	25 May 1988	24 Jan 1993
FRIGATES	NEUSTRASHIMY (JASTREB) CLASS (PROJECT 1154) (FFGI	YAROSLAV MUDRYY		Yantar, Kalinir	27 May 1988	2006	2009
FRIGATES	GEPARD (PROJECT 11661) CLASS (FFGM)	TATARSTAN (ex-Yastreb)	691	Zelenodolsk, K	15 Sep 1992	July 1993	12 July 2002
FRIGATES	GEPARD (PROJECT 11661) CLASS (FFGM)	DAGESTAN		Zelenodolsk, K	1994	2007	2008
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	ONEGA (ex-MPK 7)	164				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	MONCHEGORSK (ex-MPK 14)	190				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	MPK 56	173				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	SNEZNOGORSK (ex-MPK 59)	196				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	MPK 113	178				

FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	NARYAN-MAR (ex-MPK 130)	138				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	MPK 139	129				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	BREST (ex-MPK 194)	199				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	MPK 197	117				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	YUNGA (ex-MPK 203)	113				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	MPK 17	362				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	METEL (ex-MPK 64)	323				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	MPK 82	375				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	MPK 107	332				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	SOVETSKAYA GAVANI (ex-Le	350				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	MPK 191 (III)	369				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	MPK 178 (III)	319				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	STELYAK (ex-MPK 221)	354				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	KORETS (ex-MPK 222)	390				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	ALEKSANDROVETS (ex-MPK	059				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	SUZDALETS (ex-MPK 118)	071				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	MUROMETS (ex-MPK 134)	064				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	KASIMOV (ex-MPK 199)	055				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	POVORINO (ex-MPK 207)	053				
FRIGATES	GRISHA (ALBATROS) (PROJECT 1124/1124M/1124K/1124EI	EISK (ex-MPK 217)	054				
FRIGATES	PARCHIM II CLASS (PROJECT 1331) (FFLM)	MPK 67	301				
FRIGATES	PARCHIM II CLASS (PROJECT 1331) (FFLM)	ZELENODOLSK (ex-MPK 99)	308				
FRIGATES	PARCHIM II CLASS (PROJECT 1331) (FFLM)	MPK 105	245				
FRIGATES	PARCHIM II CLASS (PROJECT 1331) (FFLM)	MPK 192	304				
FRIGATES	PARCHIM II CLASS (PROJECT 1331) (FFLM)	KAZANETS (ex-MPK 205)	311				
FRIGATES	PARCHIM II CLASS (PROJECT 1331) (FFLM)	MPK 216	258				
FRIGATES	PARCHIM II CLASS (PROJECT 1331) (FFLM)	ALEKSIN (ex-MPK 224)	218				
FRIGATES	PARCHIM II CLASS (PROJECT 1331) (FFLM)	MPK 227	243				
FRIGATES	PARCHIM II CLASS (PROJECT 1331) (FFLM)	BASHKORTOSTAN (ex-MPK 2	244				
FRIGATES	PARCHIM II CLASS (PROJECT 1331) (FFLM)	KALMYKIA (ex-MPK 229)	232				
FRIGATES	KRIVAK (PROJECT 1135/1135M/1135MP) CLASS (FFM/FFHI	NEUKROTIMY	731	Yantar, Kalinir	22 Jan 1976	27 June 1977	30 Dec 1977
FRIGATES	KRIVAK (PROJECT 1135/1135M/1135MP) CLASS (FFM/FFHI	PYLKY	702	Zhdanov, Leni	6 May 1977	20 Aug 1978	28 Dec 1978
FRIGATES	KRIVAK (PROJECT 1135/1135M/1135MP) CLASS (FFM/FFHI	ZADORNY	955	Zhdanov, Leni	10 Nov 1977	25 May 1979	31 Aug 1979
FRIGATES	KRIVAK (PROJECT 1135/1135M/1135MP) CLASS (FFM/FFHI	LADNY	801	Kamish-Burun	25 May 1979	7 May 1980	29 Dec 1980
FRIGATES	KRIVAK (PROJECT 1135/1135M/1135MP) CLASS (FFM/FFHI	PYTLIVY	808	Yantar, Kalinir	27 June 1979	16 Apr 1981	30 Nov 1981
FRIGATES	STEREGUSHCHIY CLASS (P	2 planned					

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FRIGATES	STEREGUSHCHIY CLASS (PROJECT 20380) (FFGHM)	STEREGUSHCHIY	530	Severnaya, St	21 Dec 2001	16 May 2006	2007
FRIGATES	STEREGUSHCHIY CLASS (PROJECT 20380) (FFGHM)	SOOBRAZITELNY		Severnaya, St	20 May 2003	2007	2009
FRIGATES	STEREGUSHCHIY CLASS (PROJECT 20380) (FFGHM)	BOIKY		Severnaya, St	27 July 2005	2009	2010
FRIGATES	STEREGUSHCHIY CLASS (PROJECT 20380) (FFGHM)	SOVERSHENNY		Komsomolsk S	30 June 2006	2010	2011
FRIGATES	STEREGUSHCHIY CLASS (PROJECT 20380) (FFGHM)	STOIKY		Severnaya, St	10 Nov 2006	2010	2011
FRIGATES	ADMIRAL GORSHKOV (PRO 19 planned						
FRIGATES	ADMIRAL GORSHKOV (PROJECT 22350) CLASS (FFGH)	ADMIRAL GORSHKOV		Severnaya Ve	1 Feb 2006	2009	2011
CORVETTES	DERGACH (SIVUCH) (PROJECT 1239) CLASS (PGGJM)	BORA (MRK 27)	615	Zelenodolsk, Kazan		1987	20 May 1997
CORVETTES	DERGACH (SIVUCH) (PROJECT 1239) CLASS (PGGJM)	SAMUM (MRK 17)	(ex-575, ex-	Zelenodolsk, Kazan		1992	31 Dec 1995
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	STUPINETS (ex-R 49)	705				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 101	714				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 129	852				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 79	995				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 29	916				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 160	700				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 47	819				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	DMITROVGRAD (ex-R 291)	825				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 257	833				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 187	855				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 2	870				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	MORSHANSK (ex-R 293)	874				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 20	921				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 14	924				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 18	937				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 11	940				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 24	946				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 297	951				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 109	952				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	GROZA (ex-R 239)	953				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	IVANOVETS (ex-R 334)	954				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	BURYA (ex-R 60)	955				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 71	962				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 298	971				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 19	978				
CORVETTES	TARANTUL (MOLNYA) (PROJECT 1241.1/1241.1M/1241.1MF	R 261	991				
	NANUCHKA III (VETER) (PROJECT 1234.1) CLASS (FSGM) /						

CORVETTES	NANUCHKA III (VETER) (PROJECT 1234.1) CLASS (FSGM)	TUSHA	533
CORVETTES	NANUCHKA III (VETER) (PROJECT 1234.1) CLASS (FSGM)	AYSBERG	535
CORVETTES	NANUCHKA III (VETER) (PROJECT 1234.1) CLASS (FSGM)	LIVEN	551
CORVETTES	NANUCHKA III (VETER) (PROJECT 1234.1) CLASS (FSGM)	GEYZER	555
CORVETTES	NANUCHKA III (VETER) (PROJECT 1234.1) CLASS (FSGM)	ZYB	560
CORVETTES	NANUCHKA III (VETER) (PROJECT 1234.1) CLASS (FSGM)	PASSAT	570
CORVETTES	NANUCHKA III (VETER) (PROJECT 1234.1) CLASS (FSGM)	MOROZ	409
CORVETTES	NANUCHKA III (VETER) (PROJECT 1234.1) CLASS (FSGM)	RAZLIV	450
CORVETTES	NANUCHKA III (VETER) (PROJECT 1234.1) CLASS (FSGM)	SMERCH	423
CORVETTES	NANUCHKA III (VETER) (PROJECT 1234.1) CLASS (FSGM)	INEJ	418
CORVETTES	NANUCHKA III (VETER) (PROJECT 1234.1) CLASS (FSGM)	SHTYL	620
CORVETTES	NANUCHKA III (VETER) (PROJECT 1234.1) CLASS (FSGM)	MIRAZH	617
CORVETTES	NANUCHKA IV (NAKAT) (PROJECT 1234.7) CLASS (FSG)	NAKAT	526