Russia's state armament programme to 2020: a quantitative assessment of implementation 2011–2015

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Bild/Cover: GettyImages.Yars RS-24 at the Victory parade in Moscow 9 May 2015.

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Sammanfattning

Det statliga beväpningsprogrammet för perioden 2011–2020 antogs vid slutet av 2010 under president Dmitrij Mevedev. Programmet var mycket ambitiöst och innebar planerad anskaffning av vapen och annan militär materiel, forskning och utveckling (FoU) samt utveckling av nya system till ett värde av 20 biljoner rubel (eller USD 680 mrd vid dåvarande valutakurs). Syftet med programmet var att öka andelen moderna vapen inom de Väpnade Styrkorna från 15 procent 2010, till 30 procent 2015 och 70 procent 2020. Programmet har genomförts inom de årliga budgetfinansierade försvarsupphandlingarna och med hjälp av statligt garanterade krediter. Som en följd av detta växte försvarsindustrins produktion med 20 procent 2014, jämfört med 6 procent tre år tidigare. Volymen i anskaffningen har vuxit över perioden och införandet av ny materiel har varit särskilt påtaglig inom strategiska robottrupperna och flygstridskrafterna. Resultaten inom marin- och marksstridskrafterna är inte lika påtagliga. Under 2014 påverkades den ryska försvarsindustrin negativt av Rysslands invasion i Ukraina. Den kris som följde ledde till att det försvarsindustriella samarbetet med Ukraina bröts, med uteblivna leveranser från den ukrainska försvarsindustrin som följd. Sanktionerna från Nato- och EU-länder och har också försvårat försvarsindustrins verksamhet liksom den kraftiga nedgången i ekonomin som satt press på statsfinanserna. Det kommande beväpningsprogrammet för 2016–2025 har därför senarelagts med tre år. Icke desto mindre så har beväpningsprogrammet 2011–2020 inneburit en väsentlig modernisering av de ryska Väpnade Styrkornas utrustning för första gången sedan Sovjetunionens sammanbrott.

Nyckelord: Ryssland, beväpning, materielanskaffning, FoU, försvarsindustri, försvarsbudget, militärutgifter, Ukraina, sanktioner, utvecklingsprogram.

Summary

At the end of 2010 then President Medvedev signed an order approving the State Armament Programme for Russia for the years 2011 to 2020. This was a highly ambitious document setting out plans for the procurement of weapons and other military equipment, plus research and development for the creation of new systems, to a total value of over 20 trillion roubles, or US$680 billion at the exchange rate of the day. The aim of the programme was to increase the share of modern armaments held by the armed forces from 15 per cent in 2010 to 30 per cent in 2015 and 70 per cent in 2020. The programme has been implemented through the budget-funded annual state defence order supplemented by state-guaranteed credits. By 2014 the military output of the defence industry was growing at an annual rate of over 20 percent, compared with 6 percent three years earlier. The volume of new weapons procured steadily increased, the rate of renewal being particularly strong in the strategic missile forces and the air force, but not as impressive in the navy and ground forces. In 2014 the work of the defence industry began to be affected by the Ukraine crisis, with a breakdown of military-related deliveries from Ukraine and the imposition of sanctions by NATO and European Union member countries. The performance of the economy began to deteriorate, putting pressure on state finances. It was decided to postpone for three years the approval of the successor state armament programme, 2016–2025. Nevertheless, the implementation of the programme to date has secured a meaningful modernisation of the hardware of the Russian armed forces for the first time since the final years of the USSR.

Keywords: Russia, armaments, procurement, R&D, defence industry, defence budget, military expenditure, Ukraine, sanctions, development programmes.

Preface

This report provides an overview of the implementation of the Russian state armament programme to 2020 as the end of its first five years approaches. It is an empirical study designed to present data that is not readily accessible to analysts. The author is very grateful to FOI for its offer to publish the report and thanks Carolina Vendil Pallin for her consistent support and Susanne Oxenstierna and Tomas Malmlöf for their helpful advice and support in securing its publication.

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Acronyms

AO	Joint stock company (*aktsionernoe obshchestvo*)
Bn	billion
FSB	Federal Security Service
FSO	Federal Guard Service
FTsP	Federal Targeted Programme (*Federalnaia tselevaia programma*)
GDP	Gross domestic product
GLONASS	Global Navigation Satellite System (Russian navigation satellite system)
GOZ	State Defence Order (*Gosudarstevennyi oboronnyi zakaz*)
GPV	State Armament Programme (*Gosudarstvennaia programma vooruzheniia*)
ICBM	Intercontinental ballistic missile
MIT	Ministry of Industry and Trade
MOD	Ministry of Defence
MED	Ministry of Economic Development
MEWS	Missile early warning system
MLRS	Multiple launch rocket system
MOF	Ministry of Finance
NATO	North Atlantic Treaty Organization
OPK	Defence-industrial complex (*oboronno-promyshlennyi kompleks*)
PAK FA	Fifth generation fighter (*Perspektivnyi aviatsionnyi kompleks frontovoi aviatsii*)
PAK DP	Advanced long-range bomber (*Perspektivnyi aviatsionnyi kompleks dalnei aviatsii*)
r.	Rouble
R&D	Research and development
Rosstat	Russian Federal Agency for Statistics
RVSN	Strategic missile forces (*Raketnye voiska strategicheskogo naznacheniia*)
SLBM	Submarine launched strategic missile
SV	Ground forces (*Sukhoputnye voiska*)
SVR	Foreign Intelligence Service
trn	trillion (billion x 10)
TsKB	Central design bureau (*Tsentralno konstruktorskoe biuro*)
TsNII	Central research institute (*Tsentralnyi nauchno-issledovatelskii institut*)
TS VPK	TS VPK Information Agency, Moscow (*Teleinformatsionnaia set voenno-promyshlennnogo kompleksa*)
UAV	Unmanned aerial vehicle

VDV	Parachute troops (*Vozdushno-desantnye voiska*)
VKO	Aerospace Defence Forces (*Voisk vozdushno-kosmicheskii oborony*)
VKS	Aerospace Forces (*Vozdushno-kosmicheskie sily*)
VPK	Military-Industrial Commission (*Voenno-promyshlennaia komissiia pri Presidenta Rossiiskogo Federatsi**i***)
VMF	Navy (*Voenno-morskoi flot*)
VVS	Air force (*Voenno-vozdushnye sily*)
VV(S)T	Armaments, military (and special) equipment (*vooruzhenie, voennaia (i spetsialnaia) tekhnika*).

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1 Introduction

Developments in the last few years have put a spotlight on Russia's military capability. First, there was the brief war with Georgia, which revealed some serious shortcomings of Russia's armaments, communications and management, and then the in Ukraine, which not so much highlighted military hardware as tactics, not least so-called 'hybrid' war. Finally, there has been the engagement in Syria, which has demonstrated a new level of military competence and the fact that Russia now possesses some very capable new weapons. As President Vladimir Putin has acknowledged, the operation in Syria would not have been possible without the measures taken to raise the capability of the armed forces and that of the country's defence industry.[1] The impact of military reforms and other measures to enhance Russia's military capability have been discussed elsewhere.[2] The focus of this report is military hardware, the procurement of new weapons for the armed forces within the framework of the Russian ten-year state armament programme adopted at the end of 2010 and implemented with firm commitment during its first five years.

This report seeks to provide an overview of available quantitative data on the Russian state armament programme to 2020 and its implementation since 2011 in order to assess the extent to which the goals of the programme have been met. Have the Russian armed forces received new weapons of sufficient quantity and quality that it can be said that the country's military capability has been genuinely enhanced? The programme and its implementation has already been discussed by a number of publications by specialists within and outside Russia. Noteworthy have been the contributions of the staff of the independent research centre CAST in Moscow and of the Swedish Defence Research Agency, FOI. [3]

Information about the programme is fragmentary and has been assembled from multiple sources, not always consistent. There is also an absence of authoritative definitions of some terms and concepts relating to the programme and the criteria by which the Russian authorities judge the success or otherwise of its

[1] http://www.kremlin.ru/events/president/news/50648, 9 November 2015, 'Soveshchanie po voprosam razvitiia Vooruzhennykh Sil'.

[2] See, in particular, Hedenskog, Jakob and Vendil Pallin, Carolina (eds) (2013) *Russian Military Capability in a Ten-Year Perspective – 2013*, FOI-R--3734--SE, December and Renz, B. (2014) 'Russian Military Capabilities after 20 Years of Reform', *Survival: Global Politics and Strategy*, 56(3), 61–84.

[3] See, e.g. CAST (2015) *Gosudarstvennye programmy vooruzheniia Rossiiskoi Federatsii: problemy ispolnenii i potentsial optimizatsii. Analiticheskii doklad*, CAST, Moscow, April, the many publications of Andrei Frolov (listed under 'Literature', below), Oxenstierna, Susanne & Westerlund, Fredrik (2013) 'Arms Procurement and the Russian Defense Industry', *Journal of Slavic Military Studies*, 26:1–24, and Cooper, Julian (2012) 'Military Procurement in Russia' in McDermott, Roger, Nygren, Bertil, Vendil Pallin, Carolina (eds) *The Russian Armed Forces in Transition*, Routledge, pp. 170–175.

implementation. These are restrictions that limit the accuracy of the report. However, since the evidence is compiled from a wide range of sources it is believed that the report reflects the trends in implementation.

Compiled with the aim of making available quantitative data not readily accessible for analysts without knowledge of the Russian language or an in-depth understanding of the Russian system of arms procurement, the report has an empirical character concerned above all with the assembly and presentation of evidence. It is hoped that it will prove to be of value to those engaged in the preparation of studies of a more analytical nature.

The evidence has been compiled from a very wide range of sources, almost all available on the Internet, including Russian newspapers, journals, transcripts of radio broadcasts, reports of governmental and non-governmental organisations, decrees and other official materials of Presidential and government agencies, and statistical and other date provided by the Russian federal statistical agency and other government bodies. The procurement of weapons and the work of the defence industry are spheres covered by the elaborate Russian system of state secrecy. The state armament programme and the annual state defence order are both highly classified. For this reason data are usually made available on a partial and selective basis with some topics shrouded almost completely in secrecy, in particular matters concerning the development and production of nuclear munitions, and details of the breakdown of funding of arms procurement and military research and development (R&D). And while fragmentary data are revealed on the number of new systems procured each year, there is very rarely any information about stocks of weapons held by the armed forces and the withdrawal of systems from service. Similarly, information on the defence industry, its scale and activities, is not easily obtained, with a level of secrecy comparable with that of the final years of the Soviet Union.

By international standards Russia's military economy remains strikingly non-transparent. In the 1990s and early 2000s there were efforts by some parliamentary deputies to secure greater openness, but in more recent years there has been very little public pressure to lift to some extent the shroud of secrecy.[4] It is regrettable, but the author has no choice but to use the same methods to research present-day Russia's military economy as had to be employed to study that of the Soviet Union of the increasingly distant past. The present report testifies to the existence of a disappointing continuity between present day Russia and its Soviet forerunner.

[4] On secrecy, see Cooper, Julian (2013) *Russian Military Expenditure: Data, Analysis and Issues*, FOI-R--3688--SE, September, pp. 33–36 and the author's 'Society-military relations in Russia: the economic dimension' in Stephen L. Webber and Jennifer G. Mathers (eds) (2006) *Military and Society in post-Soviet Russia*, Manchester UP, pp.131–156.

2 State Armament Programme to 2020: principal features

The Russian state armament programme, 2011–2020 (*gosudarstvennaia programma vooruzhenii*; hereafter, GPV-2020*)* was approved by President Dmitrii Medvedev on 31 December 2010 by Ukaz, No.1565ov.[5] It is a highly classified document in twelve sections. Ten are devoted to particular services of the MOD – ground forces, navy, air force, etc. – one to all other forces and one (the tenth) to R&D relating to the development of armaments – fundamental, exploratory and applied.[6] Notwithstanding the document's classification, some details have been made available by the Ministry of Defence (MOD) and some top political leaders.

2.1 Volume of funding

The precise volume of funding of the ten-year programme has never been confirmed officially and with amendments over time may have changed since it was first adopted. Total funding is usually given as 20.7 trillion[7] roubles.[8] It has become a convention to claim that the MOD was set to receive 19.4 trillion roubles and other forces the balance, 1.3 trillion roubles, i.e. only 6.3 per cent of total spending, a surprisingly small share.[9] However, in the author's view this is incorrect and may be the outcome of a simple error. In December 2010 as the programme was being prepared for final approval, Sergei Ivanov, at the time vice-premier but previously defence minister, stated firmly that total funding of the GPV was to be 20.7 trillion roubles but on the needs of the MOD 19.04 trillion roubles[10] This is more plausible as it gives funding for other forces of almost 1.7

[5] https://mvd.ru/mvd/structure1/Departamenti/Departament_po_materialno_tehnicheskomu/Sprashivali_otvechaem/Materialno_tehnicheskoe_obespechenie, accessed 30 April 2015. The 'ov' denotes an ukaz of 'exceptional importance' (*osobo vazhnosti*), i.e. the highest level of state secrecy in Russia. The Centre for Technology and Strategy (CAST) in Moscow incorrectly numbers the ukaz 15651 (CAST (2015) *Gosudarstvennye programmy vooruzheniia Rossiiskoi Federatsii: problemy ispolnenii i potentsial optimizatsii*. *Analiticheskii doklad*, Moscow, April, p. 8).

[6] One of the documents prepared in association with the GPV is a list of critical technologies, updated every five years.

[7] One million million; 10^{12} .

[8] The total of 20.7 trillion roubles was first revealed in December 2010 (http://www.lenta.ru/articles/2011/02/25/prog/, 25 February 2011, 'Dve voeenykh piatiletki')

[9] For example, the authoritative CAST (2015) gives 19.4 and a total of 20.7 trillion roubles (p. 8). In the case of the preceding armaments programme (GPV-2015), the MOD's was allocated 4.0 trillion roubles of the total 4.9 trillion roubles funding (http://ia.vpk.ru, News, 30 May 2006), giving 18 per cent for other forces. However, the focus of this GPV was R&D for the development of new armaments, whereas the focus of GPV-2020 is the large-scale procurement of new arms by the MOD.

[10] http://zhukvesti.info/articles/detail/14851/, 21 December 2010, 'Tiazhelaia nosha dlia strany – GPV-2020'.

trillion roubles, over 8 per cent of total GPV funding, and this is compatible with a claim by Dmitrii Rogozin, deputy prime minister responsible for oversight of the defence industry, that the MOD has about 90 per cent of the total.[11] The 19.04 trillion roubles is also more easily reconciled with other data on the structure of funding for the MOD.

The full list of 'other forces' has not been revealed, but for the earlier GPV-2015 it is known that it included the Ministry of Interior (MVD) and its internal troops, the Ministry of Emergencies (MChS), the Federal Security Service (FSB) and the Border Service subordinated to it, the External Intelligence Service (SVR), the Federal Protection Service (FSO), the Federal Penal Service (FSIN), Rosatom, Rosspetstroi and the Federal Drugs Control Service (FSKN).[12]

For the MOD, 31 per cent of funding (5.9 trillion roubles) was allocated for the first five years, 2011–2015, leaving 13.1 trillion roubles for 2016–2020.[13] According to the Ministry of Finance (MOF), GPV-2020 was drawn up in *current prices*.[14]

2.2 Background to the volume of funding

In the process of drafting GPV-2020 the proposed volume of funding became a contested issue. At first the MOF, fronted by deputy minister Anton Siluanov, proposed a funding limit of 13 trillion roubles, which was considered compatible with future economic growth as then forecast. In early June 2010 this limit was challenged by the MOD, fronted by the then acting chief of armaments of the armed forces, Oleg Frolov, who argued that the proposed 13 trillion roubles would be sufficient to fund only the needs of the strategic nuclear forces, the air defence forces and the air force. An additional 15 trillion roubles would be needed for the ground forces and an estimated 7 trillion roubles for the navy and space forces. In Frolov's view, the total funding under GPV-2020 had to be at least 36 trillion roubles. In the view of the deputy chair of the Military-Industrial Commission (VPK), Vladislav Putilin, the demands of the MOD were not justified.[15] A commission was established, with independent experts, to evaluate the validity of

[11] http://www.vpk.ru (TS-VPK Internet lenta), 14 July2012 (original IA UralBiznesKonsalting).
[12] Avdeev, Yu. (2006) 'Strategiia obnovleniia', 6 June.
[13] Ekspert sovet po problemam zakonodatel'nogo obespecheniia razvitiia oboronno-promyshlennogo kompleksa pri Predsedatele Sovete Federatsii Federal'nogo Sobraniia Rossiiskoi Federatsii (2012) *Doklad o sostoianii zakonodatelstva reguliruiushchego deiatelnost oboronno-promyshlenngo kompleksa Rossiiskoi Federatsii*, Moscow, p. 18.
[14] MOF (2011) Osnovnye napravleniia biudzhetnoi politiki na 2012 god i planovnyi period 2013 i 2014 godov, July, p. 32 (http://www.minfin.ru/ru, 8 July). 'For the first time the GPV was adopted in prices of the corresponding years that will secure stability and continuity of accounting for actual outlays of the state in forming the budget and GOZ of the relevant years.'
[15] Nikol'skii, Aleksei, Kolmogorov, Vera, Tovkailo, Maksim (2010) 'VVP na oruzhie', 4 June, http://www.vedomosti.ru/newspaer/2010/-6-04/236460

the MOD's request. It was to report to the prime minister (at the time Vladimir Putin) and then present a consolidated view to the president, Dmitrii Medvedev.[16] In July first deputy defence minister Vladimir Popovkin revealed that the MOD was negotiating with MOF for an increased allocation, from 13 trillion roubles to 20 trillion roubles. In addition, there would be a programme for the development of the defence industry, also to be approved by the president at the end of the year.[17] At the beginning of August Medvedev said that the volume of resources to re-equip the armed forces would be increased 1.5 times, i.e. to 19.5 trillion roubles, indicating that the MOD's argument had been accepted by the leadership. However, at the end of November finance minister Aleksei Kudrin declared that sources of funding for the modernisation of the armed forces had not yet been found, suggesting that the MOF was still contesting the issue.[18] But in early December there were reports that Vladimir Putin, then prime minister, had demanded the presentation of GPV-2020 by the end of the year to a total value of 20 trillion roubles, 'notwithstanding the opposition of the MOF'.[19] On 31 December it was signed off by the President, although this was not announced at the time.[20] As for the expected impact on the economy, speaking at a meeting of armed forces commanders in November, President Medvedev said that to 2020 spending on national defence would be retained at a level of 2.8 per cent GDP, indicating that the new programme was based on a very optimistic long-term economic forecast.[21]

2.3 Performance indicators of GPV-2020

Indicators for monitoring the implementation of the GPV were set out in a classified government decree No. 549 of 30 August 2007, 'On the approval of rules for the elaboration and implementation of the state programme of armaments'.[22] According to an authoritative source with access to the decree, it proposed the use

[16] http://www.rbc.ru/rbcfreenews/2010060315540.shtml, 3 June 2010; http://www1.minfin.ru, 3 June 2010.
[17] Karev, Ivan (2010) 'Nado perevooruzhit i armiiu, i OPK', 28 July.
[18] http://www.minfin.ru/ru/press/speech, 30 November 2010.
[19] Netreba, Petr (2010, 'Premer-ministra patronakh ne ekonomit', *Kommersant Daily*, 14 December, p. 6. In September 2011 when Medvedev obliged Kudrin to resign as finance minister it became known that one of the issues of dispute had been the volume of funding allocated to the military, in particular the 20 trillion roubles for GPV-2020 (see http://www.forbes.ru/news/74453-medvedev-predlozhil-kudrinu-uiti-v-otstavku, 26 September 2011, 'Dmitrii Medvedev predlozhil Alekseiu Kudrinu uiti v ostavku').
[20] It was revealed by first deputy defence minister, Vladimir Popovkin, at a press conference in February 2011 (http://www.redstar.ru/2011/02/25_02/1_01.html, 25 February 2011).
[21] http://www.kremlin.ru/transcripts/9609, 25 November 2010.
[22] S. V. Khutortsev (2011) 'Gosudarstvennoi programme vooruzheniia – effektivnye metody kontrolia i upraveleniia', *Federalnyi spravochnik. Oboronno-promyshlennyi kompleks Rossii*, Vol. 7, p. 156.

of two basic groups of success indicators, the first summarising the achievement of the overall goals of the programme:

- the level of equipment of the armed forces with armaments, military and special equipment (usually abbreviated as VVST), i.e. the quantity of equipment without consideration of its novelty or technical level;[23]
- the share of modern (*sovremennye*) and advanced (*perspektivnyi*) VVST;
- the share of new VVST (with a duration of service of ten years or less);
- the share of serviceable (*ispravnye*) VVST, including that of 'priority' VVST, defined as the advance systems determining the 'face' (*oblik*) of service arms;
- rate of annual renewal of VVST.

The second group of indicators are of a simple numerical type:

- number of research projects (NIR) undertaken;
- number of development projects (OKR) undertaken;
- number of created/developed basic and critical technologies;
- number of created modern and advanced models of VVST;
- number of procured VVST, including 'priority'; number of VVST passing through repair and modernisation.[24]

[23] In the standard terminology used in Russia 'special' refers to equipment used by the security services and other government agencies for ensuring national or public security by non-military means.

[24] *Ibid.,* pp. 156–157.

Table 1
Per cent modern armaments and other military equipment of the armed forces, end of year, (target and actual levels)

	All	RVSN	VKO	VVS	VMF	SV	VDV
2020	70-100	100					
2019	64						
2018	59						
2017	48						
2016	41/51						
2015	**47**	**56**	**(52)**	**(52)**	**39**	**35**	**41**
2015	30	57	54	32	51	32	40
2014	26	56	c.40	c.28	50+	26	
2013	19	**c.50**	**60+**	**c.45**	**50+**		
2012	**16**						
2011							
2010	**15**	c.20				10	

Notes: c. approximate
RVSN Strategic missile forces; VKO Air-space defence, VVS Air force; VMF Navy; SV Ground forces, VDV Airborne troops. In 2014 VKO and VVS were merged to form an Air-space force (VKS), hence the single figure shown for actual VKO and VVS shares in 2015.
Sources:
All MOD armed forces:
Original 2013–2020 targets: http://mil.ru/mod_activity_plan/constr/vvst/plan.htm, MO, Plan deiatelnosti na 2013–2020gg.
2015 actual and 2016 revised target: http://function.mil.ru/files/morf/2015-12-11_MoD_board_extended_session_RUS.pdf , 11 December 2015, 'Tezisy doklada Ministra oborony Rossiiskoi Federatsii na rashshirennom zasedanii Kollegii Minoborony Rossii'.
2012 actual: http//vpk.name/i89680.html, 17 May 2013.
2010 actual: http://nvo.ng.ru/reality/2011-03-25/1_5tasks.html, 25 March 2011, 'Pyat zadachi Glakoverkha'
By service:
2020 RVSN:
http://function.mil.ru/news_page/country/more.htm?id=11997648@egNews, 28 October 2014.
2015 actual: http://function.mil.ru/files/morf/2015-12-11_MoD_board_extended_session_RUS.pdf, 11 December 2015, 'Tezisy doklada Ministra oborony Rossiiskoi Federatsii na rashshirennom zasedanii Kollegii Minoborony Rossii'.
2015 targets: 'Postanovka zadach Ministrom oborony Rossiiskoi Federatsii na 2015 god', *Armeiskii sbornik*, January 2015, p. 11 (Shoigu).
2014 targets: RVSN,
http://function.mil.ru/news_page/country/more.htm?id=12004148@egNews, 19

December 2014. 'Otchet na rashirennom zasedanii kollegii MO Rossii ob itogakh deiatelnosti za 2014g'; VKO, VMF: http://function.mil.ru/news_page/country/more.htm?id=11997648@egNews, 28 October 2014; VVS, SV, http://vpk.name/i124692.html,14 January 2015 (Yu. Borisov).
2013 actual: http://mil.ru/files/file/results2013/02-planMO2013,html, 22 January 2014.
Note: VKO and VVS as reported but clearly overstated.
2010 targets, RVSN, SV, http://vpk-news.ru/articles/7182, 2 March 2010, 'My ne mozhem pozvolit sebe zakupat plokhoe vooruzhenie' (interview, Vladimir Popovkin by Oleg Falichev).

It is likely that the decree provided definitions of 'modern' and 'advanced' but the classification of the document served to inhibit any public discussion of the issue. The only exception traced by the author is not very helpful. In 2013 Anatolii Guliaev, director of the department of armaments of the MOD, made it clear that the concepts of 'new' and 'modern' armaments were different. 'Modern' VVT are those which do not lag behind, or exceed, the best similar foreign models by combat, technical or exploitation characteristics.[25] However, this would not appear to be a readily applied definition, leaving much scope for subjective judgements. It may be significant that when two senior staff members of the MOD's 46th TsNII, the central institution responsible for drawing up the GPV and establishing its methodology (and as such probably the original source of the above-mentioned 2007 decree), offered a more easily operationalised definition when discussing a possible measure of the overall technical level of the stock of weaponry of the armed forces. In an article in the MOD's 46th TsNII's journal, *Vooruzhenie i ekonomika*, they propose the use of a sub-index to measure modernity, with the following definitions: 'modern' to characterise armaments and other military hardware delivered to the armed forces within the framework of the current state armaments programme. Models of VVT delivered under earlier programmes are defined as having been rendered obsolete.[26] This would appear to be a very straight forward definition and one has to wonder whether it is actually used in practice.

The principal performance criterion of GPV-2020 was set very early, the proportion of 'modern' armaments and other military equipment in the holdings

[25] Tikhonov, Aleksandr (2013) 'Minoborony i VPK: k edinoi tseli', *Krasnaia zvezda*, 25 April.
[26] Buravlev, A. I. and Monin, S. A. (2012) 'Metodika otsenki tekhnicheskogo urovnia parka vooruzheniia i voennoi tekhniki v khode realizatsiia programmnykh meroproiatii po ee zakupki i remontu', *Vooruzhenie i ekonomia*, No. 1, p. 8. Using the same approach, one could perhaps define '*perspektivnyi*' (advanced) VVT as equipment under development within the current armaments programme to be delivered to the forces before, or after, the terminal year of the current programme.

of the armed forces. By March 2009 it had been decided that by the end of 2015 this share had to be 30 per cent, rising to at least 70 per cent at the end of 2020.[27]

Table 2
MOD targets for renewal of armaments. Modern and modernised models of armaments and other military equipment *(per cent)*

	2013	2014	2015	2016	2017	2018	2019	2020
Surface ships	47	47	51	53	59	63	67	71
Submarines	41	42	44	47	54	59	65	71
Planes	23	30	37	45	55	59	67	71
Helicopters	39	54	63	71	76	79	81	85
Missile	27	64	64	82	100	100	100	100
complexes of GF	51	52	53	55	59	67	73	79
Artillery systems	20	25	37	44	56	67	75	82
Armoured	40	44	48	52	56	60	65	72
combat vehicles								
Multi-purpose								
automobiles								

Source: Ministry of Defence RF, Plan deiatelnosti na 2013–2020 gg, http://mil.ru/mod_activity_plan/constr/vvst/plan.html.

It is also not entirely clear whether the goal of a certain proportion of 'modern' VVT applies to the entire stock of weaponry of the armed forces, including equipment in storage, or only to equipment in active use and combat ready. The evidence suggests the latter.[28] This means that achievement of the set goal can be facilitated by transferring 'obsolete' armaments to store. Conversely, any return of equipment from storage back into combat use could lead to a reduction in the share of 'modern' hardware. It is also not clear whether the goal applies to all the equipment of the armed forces or to a defined subset: in March 2010 first deputy defence minister Popovkin, speaking of the target for 2020, said that the share of modern arms 'for the basic nomenclature' would be 70 per cent.[29] However, it is known that 'modern' refers not only to new armaments, but also to any newly modernised equipment, even if it dates from Soviet times, e.g. a modernised Tu-160 strategic bomber. In this case it does appear that the equipment must have been modernised within the period of the current armaments programme in order to be considered 'modern'. Finally, in addition to a summary measure of the degree of

[27] Defence minister Serdiukov at a MOD extended collegium meeting with President Medvedev, http://www.kremlin.ru/events/president/transcripts/3461, 17 March 2009.
[28] Speaking in May 2010, Medvedev said that, 'by 2015 the share of modern armaments in units and formations must reach at a minimum 30 per cent; I have in view units of permanent readiness...', http://www.kremlin.ru/events/president/news/7837, 24 May 2011.
[29] http://vpk-news.ru/articles/7182, 2 March 2010, 'My nemozhem pozvolit sebe zakupat plokhoe vooruzhenie' (interview of Vladimir Popovkin by Oleg Falichev).

modernity of the VVT of each service arm, use is also made of a measure by class of equipment, as shown in the Table 1 and 2.

Table 3
Approximate allocation of funding by MOD branch of service, 2011–2020

Service	Allocation (Billion roubles)	Per cent of total funding
Strategic missile forces	2.0[a]	10.5
Space-air defence forces	3.4[b]	17.9
Air force	4.0	21.1
Navy	5.0	26.3
Ground forces	2.6	13.7
Other	2.0	10.5
Total funding	19.0	100.0

Sources: Strategic missile forces (RVSN): Ivan Safronov, 'Minoborony pereshlo ot slov k 19 trillionam', *Kommersant Daily*, 25 February 2011. Space-defence forces (VKO): http://nvo.ng.ru/realty/2015-02-06/1_gonka.html, 6 February 2015 (A. Arbatov). Air force (VVS): http://www.vedomosti.ru/politics/2012/07/03/2242721, 4 July 2012 (A. Nikolskii). Navy (VMF): http://www.vpk-name/i96282.html, 9 September 2013 (Yu. Borisov).Ground forces, including airborne forces (SV, VDV): http://news.kremlin.ru/news/15868, 3 July 2015 (Putin).

Other: residual (assumed to be central command and control).
Notes: *a*. A. Nikolskii et al. give 1b.r. (*Vedomosti*, 4 July 2012, 'Taina 4 trln rub'), also used by CAST (2015), p. 23, but in the author's view this is too low.
b. Approximate, as Arbatov gives a planned
c. 20 percent of total spending on GPV, so could be up to 3.8 b.r.

2.4 Structure of funding of GPV-2020

According to the late Vladimir Popovkin, at the time the programme was adopted deputy defence minister for armaments, total funding was to be around 19 trillion roubles, of which 78 per cent (almost 15 trillion roubles) was to be devoted to the procurement of new armaments and other military hardware, 10 per cent (2 trillion roubles) to R&D for the development of new weapons, and the remaining 12 per cent, following the normal allocation under the GPV, for the repair and modernisation of existing armaments.[30] The volume and structure of funding of the programme is shown in Table 3, which shows the allocation of funding by service of the armed forces, Table 4, which shows the annual funding of the state

[30] *Ibid.*

defence order, and Table 5, which shows the structure of spending on the defence order.

Table 4

Funding of the MOD GOZ for armaments *(billion roubles)*

	Planned GOZ	Actual GOZ	Planned State guaranteed credits	Actual State guaranteed credits	Total planned GOZ	Total Actual GOZ
2015P	1 886.1		26.0		1 912	
2014	1 250.0[a]	1 190.0	496.9	470.9	1 740	1 661
2013	969.0	930.0	399.5	350.5	1 369	1 280
2012	679.1	644.0	199.9	189.7	879	834
2011	553.8	553.6	168.9	123.2	723	677
2011–15	5 338.0	3 317.6	1 291.2	1 134.3	6 623	4 452
2010	470.4	476.1				
2009	476.6	473.8				
2008	388.7	388.7				
2007	270.3	300.3				
2006	236.7	236.8				
2006–10	1 842.7	1 875.7				

Sources: 2005–2012 Data of TS VPK, http://www.vpk.ru/ except actual state guaranteed credits, from annual laws on budget implementation (TS VPK mistakenly gives 2011 as 153 b.r).
2013–2015, author's estimate on the basis of available data on federal budget. The total given may be overstated as it may include a modest amount of funding under other classified programmes.
Laws on implementation of federal budget:
2013: http://asozd2.duma.gov.ru/main.nsf/(Spravka)?OpenAgent&RN=561208-6
2012: http://asozd2.duma.gov.ru/main.nsf/(Spravka)?OpenAgent&RN=312571-6
2011: http://asozd2.duma.gov.ru/main.nsf/(Spravka)?OpenAgent&RN=106468-6
Notes: a. Fulfilled to 95% (http://vpk.name/i124692.html, 14 January 2015, Yu. Borisov). DB Draft budget. P Planned.

Table 5

The structure of expenditure on the MOD GOZ, 2005-2015 *(per cent of total)*

Year	Procurement	Repairs	R&D
2015[a]			14.7
2014			17.6
2013[a]	58.9	23.0	17.2
2012	56.2	24.6	19.2
2011	58.1	22.2	19.7
2010	61.6	15.5	22.9.
2009	57.0	15.9	27.1
2008	54.7	20.9	24.4
2007	47.9	20.7	31.4
2006	48.7	20.6	30.7

Source: 2006–2013, TS VPK (http://www.vpk.ru/cgi-bin/cis/w3.cgi/CMS/Item, *Otrasli VPK, 2012 god*, accessed 6 March 2015.
2014, 2015 federal budget as amended, calculated by author from available data on budget (2014 actual spending).
Note: a. Planned

Since 2011, spending on the annual state defence order has accounted for a steadily increasing share of total spending under the budget chapter 'national defence', which accounts for most of the spending on the armed forces of the MOD. As can be seen in Table 6, the share has risen from over 36 per cent in 2011 to 60 per cent in 2015, but should fall back to less than 55 per cent in 2016.

Table 6

Budget-funded state defence order and spending on 'national defence', 2011–2016 *(billion roubles)*

	2011 actual	2012 actual	2013 actual	2014 actual	2015 budget	2016 budget
'National defence'	1 516	1 812	2 104	2 479	3 166	3 147
Per cent GDP	2.7	2.9	3.2	3.5	4.3	4.0
State defence order	554	644	930	1 190	1 900	1 700
Per cent of 'national defence'	*36.5*	*35.5*	*44.2*	*48.0*	*60.0*	*54.0*

Source: 'National defence' and GDP, 2011–2015: Julian Cooper, 'Military expenditure in the Russian federal budget for 2015 and the draft budget for 2016', October 2015, unpublished paper for SIPRI; 2016: http://minfin.ru/ru/#, 14 December 2015, *Biudzhet dlia grazhdan k federalnomu zakonu o federalnom biudzhete na 2016 god*, p. 8. State defence order: estimate of author.

2.5 Fulfilment of annual state defence order

Measurement of the extent to which the annual GOZ has been implemented is undertaken in terms of the number of orders completed during the year. For 2014, there were 3 100 orders, of which 157 were not completed, giving a fulfilment of 95 per cent. However, as they are completed in the following year the implementation rate increases. So, by the end of May 2015, GOZ-2014 had been fulfilled to 97 per cent.[31] The trend of fulfilment since 2009 is shown in Table 7.

Table 7

Implementation of the annual state defence order *(per cent)*

Year	Implementation
2015	c.96.0
2014	95.0/96.7[a]
2013	93.2/95[b]
2012	81.7/c.98
2011	96.3
2010	70.0
2009	50.0

Sources: 2015 provisional: http://www.ntv.ru/novosti/1579816/?fb#ixzz3tL02pu4s, 4 December 2015 (D. Rogozin, TV interview).2012–2014: http://transcript.duma.gov/node/4314 (D. Rogozin speaking in State Duma, 1 July 2015) (assumed to be end of calendar year data). 2009–2011, 2012 (98), 2013 (95): http://lenta.ru/news/2014/02/14/goz/, 14 February 2013, 'Voennye otchitalis ob ispolnenii gosoboronzakaza 2013 goda' (assumed to be final data, except for 2013).

Notes: a. by mid-February 2014. b. by end June 2014.

c before figure – approximate

[31] http://www.armstrade.org/includes/periodics/news/2015/0529/101529402/detail.shtml, 29 May 2015, 'Yurii Borisov gosoboronzakaz na 2014 god vypolnen na 97 prots'.

3 The defence industry and the state defence order

Prior to the adoption of GPV-2020 the annual rate of growth of output of the defence industry was modest and the civilian share was 40–50 per cent of the total. With the implementation of the programme the rate of growth of output increased and the military share of the defence industry's total production rose. Reflecting the priorities of GPV-2020, the shares of the aviation and shipbuilding industries in total output grew and of that of the ground forces equipment industry stabilised. Trends in the development of the defence industry under the impact of GPV-2020 are shown in the following tables. Table 8 shows the structure of spending on the MOD state defence order by branch of the defence industry, indicating the growing share of the aviation industry in recent years.

Table 8
The structure of the MOD GOZ by branch of the defence industry
(per cent of total expenditure)

Year	Aviation industry	Missile-space industry	Ground forces equipment industry	Munitions industry	Ship building industry	Radio-electronics industry	Other
2012	23.8	16.1	12.5	0.8	14.6	22.4	9.8
2011	24.1	14.5	7.8	0.8	18.3	22.5	12.0
2010	21.5	16.7	9.9	1.1	19.3	20.1	11.4
2009	21.9	18.1	10.8	1.9	19.0	18.6	9.7
2008	15.3	17.2	13.0	3.1	16.3	21.8	13.3
2007	12.3	17.9	13.1	2.9	17.6	22.0	14.2
2006	12.8	18.8	12.9	3.1	16.0	20.8	15.6
2005	11.5	17.9	12.5	3.2	15.8	21.8	17.3

Source: TS VPK (http://www.vpk.ru/cgi-bin/cis/w3.cgi/CMS/Item, *Otrasli VPK, 2012 god*, accessed 6 March 2015.
Notes: 'other' may refer to equipment such as motor vehicles obtained from nominally civilian branches of industry. Products of the radio-electronics industry include air defence systems.

As shown in Table 9, the implementation of the state defence order is heavily concentrated at defence industry facilities located in the Central Federal District of the Russian Federation,

Table 9
The distribution of the spending on the MOD GOZ by federal district *(per cent of total funding)*

	Central	North West	Southern	Volga	Urals	Siberia	Far East	North Caucasus
2012	57.8	12.6	2.0	12.3	6.0	4.4	4.2	0.7
2011	46.3	15.9	2.4	16.1	6.1	5.7	7.1	0.4
2010	41.7	20.7	5.2	12.9	5.1	7.3	6.7	0.5

Source: TS VPK (http://www.vpk.ru/cgi-bin/cis/w3.cgi/CMS/Item, *Otrasli VPK, 2012 god*, accessed 6 March 2015.
Notes: The table probably overstates the role of the Central Federal District in so far as the lead companies of many corporations (in Russia known as 'integrated structures') are located in Moscow city or region.

As funding of the GOZ increased rapidly, so also did the industrial output of the defence sector. Table 10 shows the growth of total output, military and civilian, between 2010 and 2014.

Table 10
The defence industry, annual change of industrial output *(per cent)*

	2011	2012	2013	2014
Total output of the defence industry	5.8	5.8	13.9	15.5
By branch				
Aviation	9.0	12.3	17.2	17.1
Missile-space	10.6	11.8	15.3	8.6
Conventional arms	17.1	7.0	2.8	5.4
Munitions	2.5	7.6	9.1	13.0
Shipbuilding	-13.2	-7.8	1.4	14.4
Radio-electronics	9.8	17.1	29.5	24.0
Industrial output, Russia	5.0	3.4	0.4	1.7

Source: 2014 total and by branch: http://government.ru/dep_news/17702/, 21 April 2015
2011–2014: Oleg Riantsev, 'Ob osnovnykh itogakh razvitiia situatsii v oboronno-promyshlennom komplekse v 2014 godu i osnovnykh zadachakh na blizhaishuiu perspektivu' in *Federalnyi spravochnik, Oboronno-promyshlennyi kompleks*, Vol. 11, June 2015, p. 226.
All Russian industrial production:
http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/enterprise/industrial/#

But the sector's civilian output has not fared as well, with very modest growth or some decline in most sectors (see Table 11) and over time its share of the defence industry's output has fallen, as shown in Table 12.

Table 11
Civilian production of the defence industry, annual change *(per cent)*

	2011	2012	2013	2014
Total civilian output of defence industry	6.9	-4.0	2.4	-1.8
By branch				
Aviation	-1.3	-6.5	20.4	2.1
Missile-space	13.4	2.0	6.9	-6.0
Conventional arms	27.5	8.7	-13.3	-9.4
Munitions	1.9	0.3	-3.5	-4.1
Shipbuilding	-4.4	-33.9	-4.6	0.3
Radio-electronics	4.3	4.5	-1.9	4.7
Industrial output, Russia	5.0	3.4	0.4	1.7

Source: As Table 10.

Driven by sharply increase spending on the state defence order, plus a more modest rate of growth of arms exports, the military output of the defence industry has grown rapidly and at an accelerating pace since GPV-2020 began in 2011, as shown in Table 13. With increased funding, rates of pay in the defence industry have increased substantially, making it easier to attract and retain personnel (see Table 14). The rate of decline of personnel, previously quite rapid, has been halted and in some branches has started to increase.

Table 12
Share of civilian production in total volume of the defence industry *(per cent)*

	2011	2012	2013	2014
All defence industry	33.7	28.7	25.4	20.9
By branch				
Aviation	25.5	21.3	23.0	19.3
Missile-space	45.0	41.1	38.5	33.4
Conventional arms	48.1	45.9	37.2	30.3
Munitions	60.8	57.3	50.3	42.2
Shipbuilding	30.2	19.1	18.0	14.8
Radio-electronics	25.3	21.6	15.2	12.8

Source: As Table 10.

3.1 Classified support programmes for GPV-2020

There are two federal targeted programmes (*federalnye tselevye progammy* – FTsP) which are supposed to facilitate the implementation of GPV-2020 by funding the modernisation of the industrial base of the defence sector and securing needed scarce materials. Both programmes are highly classified, although a few details are sometimes provided by top government officials. There is little evidence available on their funding which, like the funding of the GPV, is not shown in the open, published, version of the federal budget but in secret, or top secret, appendices.

Table 13
Approximate rate of growth of military production of the defence industry

	2011	2012	2013	2014
All military production	5.8	13.1	17.8	20.1
By branch				
Aviation	12.2	17.4	13.3	20.6
Missile-space	8.4	18.7	20.5	15.9
Conventional arms	7.5	5.5	12.3	11.8
Munitions	3.6	17.3	21.9	25.4
Shipbuilding	-17.0	-2.8	2.7	16.9
Radio-electronics	11.6	34.0	35.1	28.8
Industrial output, Russia	5.0	3.4	0.4	1.7

Source: Calculated from data of last three tables, approximate.
Note: According to D Rogozin, military output of the defence industry grew by 21 per cent in 2014; civilian by almost -2 per cent (http://oborona.gov.ru/news/view/6249, 10 September 2015, 'Rogozin konstatiruet polozhitelnye tendentsii v razvitii "oboronki"' (original TASS)).

- ***FTsP 'Development of the defence-industrial complex, 2011–2020'*** [32]

In principle, this programme should have been adopted simultaneously with GPV-2020 to ensure that the industrial capacities and technologies required to manufacture new armaments were ready when their development had been completed. In reality, it was adopted over a year after the armaments programme, by government decree of 5 March 2012.[33] The lead is taken by the Ministry of Industry and Trade but the programme applies to enterprises and R&D organisations of Roskosmos, the state corporation 'Rostekh', and other

[32] *FTsP dlia razvitii oboronno-promyshlennogo kompleksa, 2011–2020 gg.* (Cooper, Julian (2013) p. 28).
[33] http://www.minpromtorg.gov.ru/industry/defence/92/, 8 June 2012 (Igor Karavaev, deputy minister responsible for oversight of the defence industry).

government and corporate structures involved in implementing state defence orders. According to the minister, Denis Manturov, total funding is 2 800 billion roubles over ten years, of which 1 800 billion roubles (64.3 per cent) is from the federal budget, the remaining 1 000 billion roubles from the resources of companies.[34] It has been reported that 80 percent is to fund capital investment for the creation of new capacities and the upgrading of existing facilities, not only for production, but also for development and testing. There is also funding for training and retraining approximately 200 000 workers of the defence industry.[35]

Table 14
Average wage in the defence industry as an indication of changing priorities
(roubles per month)

	2011	2012	2013	2014	2014 as % 2011
Shipbuilding	29 993	34 478	40 202	46 917	156
Missile-space	30 086	34 229	39 265	42 899	143
Radio-electronics	24 565	29 384	34 159	39 629	161
Aviation	25 918	29 628	33 906	38 179	147
Ground forces eq.	21 555	25 794	28 473	31 887	148
Munitions	17 165	20 106	23 699	27 428	160
All defence industry	25 618	28 754	34 159	38 744	151
- industry	22 139	25 805	29 639	33 843	153
- R&D	32 474	37 384	43 198	48 500	149

Sources: Oleg Ryantsev, 'Ob osnovnykh itogakh razvitiia situatsii v oboronno-promyshlennom komplekse v 2014 godu i osnovnykh zadachakh na blizhaishuiu perspektivu' in *Federalnyi spravochnik, Oboronno-promyshlennyi kompleks*, Vol. 11, June 2015, p. 227.
Notes: In 2011 the defence industry average wage (industrial) was 3.8 per cent more than the average in Russian manufacturing industry; by 2014 15 per cent more.

The goals of the programme were highly ambitious: by the end of the period 80 per cent of the basic assets of the defence industry must be no older than ten years, labour productivity was to increase by 2.6 times.[36]

[34] http://archive.government.ru/docs/18490/, 22 March 2012, 'V.V.Putin provel soveshchanie po realizatsii zadach, postavlennykh v ego predvybornykh statiakh v kachestva kandidata no post Prezidenta Rossiiskoi Federatsii'.
[35] Sovet Federatsii, Komitet Soveta Federatsii po oborone i bezopasnosti, Parlamentskie slushaniia, *Sostoianie i problemy oboronno-promyshlennogo kompleksa Rossiiskoi Federatsii*, 16 February 2012, Izd. Soveta Federatsii, p. 20.
[36] Evdokimov, Andrei, Karapetian, Narina, Rutman, Mikhail, Silnikov, Mikhail and Usova, Tatiana (2012) 'Ne nado pugatsia slova "militarizatsiia"', *Voenno-promyshlennyi kurer*, 17 July.

To supplement funding of the FTsP, the government decided to introduce from 2013 the option of applying for state guaranteed credits. Their volume is shown in Table 15.

As can be seen from the table, take up of these credits has been minimal. This may also apply to funding under the programme by enterprises.

- ***FTsP 'Development, restoration and organisation of the production of strategic scarce and import substituting materials and small-scale chemistry for armaments, military and special technology in 2009–2011 and period to 2015'.***[37]

The programme, adopted from 2009, is aimed at organising an adequate volume of production of strategic materials to meet the needs of the production of armaments and other military equipment under the GPV. The volume of funding has not been revealed. In some cases it involves the restoration of production undertaken in Soviet times but then abandoned as arms production collapsed in the 1990s; in others substituting materials in Soviet times obtained from other republics, now independent countries with which Russia may not now have close relations.

According to industry minister Manturov, during the first four years of the programme's implementation more than 450 materials and 500 technologies for their production had been developed in the interests securing the manufacture of over a hundred models of armaments and other military hardware.[38]

[37] FTsP, 'Razrabotka, vosstanovlenie i organizatsiia proizvodstva strategicheskikh defitsitnykh i importozameshchaiushchikh materialov i malo tonnazhnoi khimii dlia vooruzheniia, voennoi i spetsialnoi tekhniki na 2009–2011 gody i na period do 2015 g.' (Cooper, Julian (2013, p. 28).
[38] http://old.minpromtorg.gov.ru/industry/defence/98, 29 March 2013.

Table 15
State guaranteed credits for funding the FTsP 'Development of the defence-industrial complex' in the 2013–2016 budget *(million roubles)*

	Budget limit	Actual credits granted
2016	47 232	
2015	80 951[a]	
2014	55 789	526
2013	31 496	0

Sources: Budget limits, as laws on federal budget of each year, 2016 budget, http://publication.pravo.gov.ru/SignatoryAuthority/president, 15 December 2015.

Actual credits granted: law on implementation 2013 budget; 2014 actual: draft federal law on implementation of 2014 federal budget and accompanying materials, http://asozd2.duma.gov.ru/main.nsf/(Spravka)?OpenAgent&RN=847442-6, 29 July 2015.

Notes: a. Note in the original draft budget for 2015–2017, credits of 114 214 m.r. were envisaged, reduced to 80 951 during the second reading,

3.2 A new state programme

Work is now underway on new versions of both defence industry programmes extending them to 2025. However, they will no longer be separate FTsP but grouped to form a new state programme for the development of the defence industry, with a number of sub-programmes.[39] It was the intention to complete its elaboration and approval so that it could begin to act from 2016, but the work was not completed in time to include it in the federal budget for 2016. However, this does not rule out the inclusion of the new state programme in a later amended version of the budget.[40]

According to intentions in early 2015, a new state programme, No. 44, was to have been adopted for inclusion in the federal budget for 2016–2018, 'The development of the defence-industrial complex of the Russian Federation during 2016–2025'. This programme will group together a number of existing FTsPs and also introduce a new sub-programme providing budget support for import substitution activities and general financial support for the defence industry. The new state programme will also incorporate a number of elements of existing state programmes that relate to the defence industry, in particular the sub-programme 'Acceleration of the development of the defence-industrial complex' currently under state programme

[39] On the transition in Russia to a programme structure for the federal budget, see Cooper, Julian (2013), pp. 45–47.
[40] http://transcript.duma.gov.ru/mode/4314 (Stenogramma zasedanii 1 iiulia 2015g) (D. Rogozin, State Duma 'government hour', 1 July 2015).

No.16, 'The development of industry and raising its competitiveness in the period to 2020', but also parts of No. 17, 'Development of the aviation industry, 2013–2025', No.18, 'Development of the shipbuilding industry, 2013–2020', No. 19, 'Development of the electronics and radio-electronics industry, 2013–2025' and No. 21, 'Space activity of Russia, 2013–2020'.[41]

The aim is to coordinate the state programme No. 44 with the new GPV-2025 in order to ensure that the defence industrial base will be adequate for its implementation. There is little doubt that most of the programme and its funding will be classified.

The programme will include the following sub-programmes:[42]

- 44.1 Stimulating the development of the defence-industrial complex (discussed below)
- 44.2 FTsP 'Development of the defence-industrial complex, 2016–2025'
- 44.3 FTsP 'Utilisation of stocks of chemical weapons'
- 44.4 FTsP 'Development, restoration and organisation of the production of strategic scarce and import substituting materials and small-scale chemistry for armaments, military and special technology, 2016–2025'.[43]

It is possible that the new state programme will include other classified sub-programmes, e.g. the FTsP 'Development of the nuclear weapons complex, 2007–2020', regarded as top secret and hardly ever mentioned in Russian publications. At present only the funding of sub-programme 44.3 is treated as an open budget item.

In late August 2015 it was reported that the Military-Industrial Commission, the VPK, had rejected a draft of the FTsP 'Development of the defence-industrial complex, 2016–2025' submitted by the Ministry of Industry and Trade and sent it back for redrafting. Points at issue included, it was reported, an inadequate growth of labour productivity as a result of the modernisation of enterprises, and lack of priorities in the development of the domestic engine-building industry, the radio-electronics industry and the production of new materials. This suggests that the VPK was not satisfied with the degree to which the programme would secure self-

[41] *Sistema programmno-tselevogo planirovaniia razvitiia oboronno-promyshlennogo kompleksa Rossii*, Powerpoint presentation (http://myshared.ru/slides/912819/#, no date), slide 3, accessed 8 October 2015.

[42] Prikaz Minfin Rossii, No 90n, 8 June 2015, O vensenii izmenenii v Ukazanii oporiadke primeneniia biudzhetnoi klassifikatsii Rossiiskoi Federatsii, utverdzhennye prikazom Ministerstvo finansov Rossiikoi Federatsii ot 1 iiulia 2013 g. No 65n' (published http://minfin.ru/common/upload/library/2015/07/m, 8 July 2015, pp. 144-145.

[43] Not shown in source, as classified, but its inclusion confirmed by Rogozin, http://transcript.duma.gov.ru/mode/4314 (Stenogramma zasedanii 1 iiulia 2015g) (D. Rogozin, State Duma 'government hour',1 July 2015).

sufficiency. It was also concerned with an inadequate development of the procedures for its implementation which, it was believed, would lead to an unacceptable degree of bureaucratisation.[44]

As the new state programme, No. 44, had not been agreed by October 2015 it was not included in the draft federal budget for 2016. However, there was a large, unexplained, increase in the budget sub-chapter 'other questions in the field of national defence', the part of the budget likely to include most of the spending under the new programme. It is possible that a contingency fund has been created to cover the programme's funding prior to its inclusion in an amended version of the budget sometime in 2016.

[44] Cheberko, Ivan (2015) 'Programmu razvitiia VPK otpravili na dorabotku', *Izvestiia*, 28 August.

4 The impact of Russia's annexation of Crimea and military action in Ukraine

Russia's military action in Ukraine, the annexation of Crimea followed by involvement in aggressive action in the East of the country, is having an impact on the implementation of GPV-2020, firstly because of Kiev's decision in May 2014 to end all deliveries of arms, military hardware and components to Russian, and secondly because of the sanctions imposed on Russia by NATO and EU member countries, which make it impossible to acquire from them end-product weapons systems and restrict access to systems and components, plus technologies for the production of armaments and other military hardware. To some extent the impact of these measures has been blunted by the practice of enterprises, dating back to Soviet times, of holding large stocks of externally supplied inputs, but over time problems have mounted, requiring a policy response.

4.1 The breakdown of military relations with Ukraine

While the share of Ukrainian inputs in the output of the Russian defence industry was relatively modest, only 3.5 per cent according to one informed source, in some sectors the dependence was very significant.[45] There are four main problems for Russia arising from the end of deliveries from Ukraine: power units for surface ships, aero-engines, in particular for helicopters, the building of some types of aircraft, and the maintenance of heavy ICBMs.

- ***Power units***

Since distant Soviet times the research-production complex of gas turbine building 'Zorya-Mashproekt' located in Mykolaiv in Southern Ukraine has been a major supplier of propulsion units and power trains for surface ships and boats built in Russia, in particular frigates.

- ***Aero enginges***

Since the 1990s the Rybinsk 'Saturn' aero engine company has been attempting to develop a domestic source of supply but with limited success. Almost all engines for both Mil and Kamov helicopters have been developed and built in Ukraine by the 'Ivchenko-Progress' engine design bureau and the 'Motor Sich' corporation, both located in Zaporizhia. It has also supplied engines for fixed-wing planes, including the Yak-130 trainer. Unlike 'Zorya-Mashproekt', part of the state

[45] Mukhin, Vladimir (2015) 'Vladimir Putin proschityvaet ugrozy', *Nezavisimaia gazeta*, 11 September.

corporation 'Ukroboronprom', 'Motor Sich' is an independent private company and as such has had a greater degree of freedom in its activities, retaining very strong links with Russia, partly because of the role of its wily Soviet-era president, Viacheslav Boguslaev. It is possible that engines for transport helicopters and helicopters for export are still being delivered. In this case Russia started import substitution activities a few years ago, developing the building of engines, with the cooperation of 'Motor Sich', at the 'Klimov' works in St. Petersburg. The initial focus was on the domestic manufacture of engines for combat helicopters and the Yak-130 and considerable progress was made prior to the Ukraine crisis.[46]

- ***Transport aircraft***

In Soviet times the Kiev Antonov design bureau was the country's principal developer of transport aircraft, in particular heavy-lift planes used by the armed forces. With very limited funding during the 1990s and early 2000s Russia's engagement with Antonov diminished but revived when more funding became available for arms procurement. GPV-2020 marked a new stage of this relationship. Russia was interested in building, in cooperation with Ukraine, both the new An-70 transport and a modernised version of the larger An-124, a design dating back to late Soviet times. However, problems were encountered and both projects had been effectively abandoned before relations between the two countries broke down. Russia organised the domestic building of two Antonov transport-passenger planes, the An-140 and An-148, with the supply of some components from Ukraine. Now the assembly of both has been halted.

- ***Maintenance of ICBMs***

Since the collapse of the Soviet Union, Ukrainian specialists have been engaged in the maintaining in combat use strategic missiles built by the vast 'Yuzhmash' state enterprises in Dnepropetrovsk. The Strategic Missile Forces of Russia retain approximately 46 RS-20V/R-36M2 'Voevoda' (NATO designation SS-18, 'Satan') heavy liquid-fuelled ICBMs, developed by the co-located 'Yuzhnoe' design bureau. Originally scheduled for withdrawal by 2010, the life of the missiles has been extended and now their complete withdrawal from service is expected by 2018. They are to be replaced by a new heavy liquid-fuelled strategic missile with multiple warheads, the 'Sarmat', now under development. In this case Russia claims that the missiles are now being serviced fully by Russian specialists.

- ***Other issues***

There are many other examples of Ukrainian supplies to Russia but not with the strategic importance of the cases outlined above. Very often the links did not involve modern, high technology, inputs but older, often Soviet-era, systems and components which were manufactured in Ukraine at a relatively low cost, giving

[46] 'Motor Sich' also manufactures engines for UAVs and it is possible that Russia's plans in this field may have been affected by the breakdown.

little incentive for organising alternative domestic supply. Examples include air-to-air missiles built by 'Artem' of Kiev, but mainly supplied for Russian export contracts, and electronic components, including inputs for air defence systems built by the 'Almaz-Antei' corporation.[47] 'Luganskii akkumulyatory' of Ukraine was a major supplier of batteries used in Russian built torpedoes arming ships and submarines, but it was reported in August 2015 that domestic production had been organised at a factory in Cheliabinsk.[48]

4.2 Sanctions of NATO and EU member countries

Sanctions adopted by the West against Russia ban the sale of any weapons systems or military hardware to Russia, plus systems and components for them.[49] In fact, by the time of the Ukraine crisis there were only a limited number of relevant cases as the policy of importing equipment from NATO and EU member countries adopted by former defence minister Anatolii Serdiukov was soon reversed by his successor, Sergei Shoigu. However, the biggest foreign purchase of all, the contract to buy two 'Mistral' class helicopter-carrying landing craft, with the option of building two more in Russia, was still being implemented and became subject to the sanctions. Agreement on the terms of the cancellation of the deal was finally reached in August 2015, leaving France free to seek alternative customers, although that could be extremely difficult as the two completed vessels were built to Russian specifications.

- ***Electronic components***

For the Russian defence industry the issue of greatest concern is the limitation placed on access to dual-use technologies, in particular electronic components and advanced production equipment, both fields in which Russia has a very high level of import dependence. In the words of Dmitrii Rogozin, microelectronics and machine tool building are 'two Achilles heals' of Russia.[50] While Belarus remains a significant supplier of electronic components (more than 80 per cent of the output of its leading producer 'Integral' goes to the Russian market), the defence industry is still heavily dependent on imports from the United States and other NATO and EU countries.[51] As acknowledged by Viacheslav Khalitov, deputy director for

[47] 'Kontsern PVO "Almaz-Antei" mozhet polnostiu perenesti proizvodstvo s Ukrainy v Rossiiu', http://www.armstrade.org/includes/periodics/news/2014/0410/1705234/, 10 April 2014.

[48] http://vpk.name/news/137674_ural'skii_zavod_naladil_vyipusk_batarei_k_torpedam_vmesto_ukrainskih.html, 4 August 2015.

[49] For an overview and analysis of the sanctions against Russia see Oxenstierna and Olsson (2015). See also Connolly (2015).

[50] http://www.ntv.ru/novosti/1579816/?fb#ixzz3tL02pu4s, 4 December 2015, interview on NTV.

[51] Bibikov, Vladimir (2015) 'Svoia skhema ne podvedet', *Rossiiskaia* gazeta, 8 May; The 'Roselektonika' holding company of 'Rostekh', the principal supplier of the defence industry, is

defence production of 'Uralmashzavod', even such recently developed new weapons as the 'Armata' tank have US and European electronic components, although in this case there is optimism that they can be substituted.[52] However, some sectors appear to have already a high degree of reliance on domestically produced components: according to the general director of 'Roselektronika', Andrei Zverev, the electronic component base of the strategic nuclear forces is entirely developed and manufactured within Russia.[53] There is evidence that in expectation that market conditions could become more difficult enterprises of the radio-electronics industry sharply increased their imports in 2014, by 2.6 times to $773 million, probably to increase stocks of components in an attempt to insure against sanctions.[54] The extent of import dependence on Russia's market for radio-electronic products is shown by the industry's target for 2015: to raise the share of domestic production to 20 per cent, and the share of the world market to 0.5 percent.[55] Given its priority and the striving for self-reliance in strategic sectors it is likely that the import dependence of the defence industry is not as high but may still be very substantial.

- ***Machine tools and advanced production equipment***

Import dependence on EU and NATO member countries is especially acute with respect to machine tools and other advanced production equipment. According to the Ministry of Industry and Trade, 88 per cent of the machine tool market is currently taken by imports and the share may be even higher for the defence industry in so far as domestic manufacture tends to focus on equipment not at the frontier in terms of precision and degree of automation.[56] In recent years there have been efforts to strengthen the domestic production capability in machine tools and tooling. 'Rostekh' now has control of 'Stankoprom' holding company, created in 2013, uniting eight of the country's leading producers and charged by the government with being the systems integrator (i.e. an agency bringing together component sub-systems so as to meet the specific needs of customers) for the entire Russian machine tool industry.[57] It has an orientation to securing the needs

seeking a majority ownership stake in 'Integral', in effect converting it into a domestic producer, http://rosrep.ru/news/, 6 February 2015, '"Roseleltronika" dogovorilas o poluchenii kontrolia belorusskom proizvodetele mikroskhem'. (Original ITAR-TASS).

[52] http://echo.msk.ru/programs/arsenal/1596244-echo,'Arsenal' TV programme with Viacheslav Khalitov, 3 August 2015.

[53] http://rosrep.ru/new/, 9 April 2014, 'RF ne zakupaet za rubezhom elektroniku dlia svoego raketno-iadernogoshchita'. (original, *RIA Novosti*).

[54] http://rosrep.ru/otrasl/, 20 May 2015, 'Reshenie rasshirennogo soveshchaniia ruovoditelei predpriiatii radioelektronnoi promyshlennosti 2015 goda'.

[55] Ibid.

[56] http://www.vz.ru/infographic/2015/7/21/757291.html, accessed 13 August 2015. Import dependence is probably even more pronounced for control systems for numerically controlled machine tools.

[57] See, e.g., Popov, Egor, Tsinoeva, Yana and Rozhdestvenskaia, Yana (2014) 'Gosudarstvo vstaet k stanku', *Kommersant*, 15 December.

of the defence industry. However, the modernisation policy being pursued in part involves the creation of joint ventures with foreign partners and this may now be under threat.[58]

4.3 The Russian policy response: import substitution

- ***Ukraine***

Analysis of risks to the Russian defence industry of a breakdown of supplies from Ukraine began in March–April 2014 and plans started to be elaborated for import substitution measures. In mid-June President Petro Poroshenko announced that all military-related deliveries to Russia were being ended. The programme, valued at approximately 50 billion roubles, was approved by Putin in July.

It is a detailed, classified, schedule of import substitution activities over a period lasting to 2018. It will be part-funded from the federal budget but a large proportion of the measures will be realised from the resources of enterprises.[59] It has been claimed that the programme covers more than 3 000 components and systems, produced by over 160 Ukrainian enterprises, entering into more than 200 models of armaments, military and special hardware (VVST).[60] However, more recently Dmitrii Rogozin has said that only 186 models of VVST are covered, possibly because some of the issues have already been resolved.[61] According to deputy defence minister, Yurii Borisov, by October 2015 components for 65 models of armament had been substituted of an annual plan of 102.[62]

- ***NATO and EU countries***

A programme of import substitution measures in response to Western sanctions affecting the defence sector was adopted by the Military-Industrial Commission

[58] A recent example is the opening in May 2014 of production capacity at 'Kovrovskii elektromekhanicheskii zavod' of the defence industry, one of the country's oldest machine tool builders, for the assembly of NC high-precision lathes of the Takisawa company of Japan, http://vpk.name/i110452.html, 20 May 2014, 'V Kovrove zapushcheno proizvodstvo odnogo mirovykh liderov stankostroeniia'.

[59] Maetnaia, Elizaveta and Baiazitova, Aleksandra (2014) 'Programme importzameshcheniia otsenili v 50 mlrd', *Izvestiia*, 11 August, p. 1; Barabanov, Mikhail (2015) 'Reorginizatsiia VPK Rossii posle razryva otnoshenii s ukrainskimi predpriiatiami' (from annual report *Rossiia 2015* of Franco-Russia analytical centre 'Observo' ,http://bmpd.livejournal.com/1345291.html, 18 June.

[60] Maetnaia, Elizaveta and Baiazitova, Aleksandra (2014) 'Programme importzameshcheniia otsenili v 50 mlrd', *Izvestiia*, 11 August, p. 1.

[61] http://government.ru/news/19246/,11 August 2015, 'Pervoe zasedanie Pravitelstvennoi komissii po importzameshcheniiu'.

[62] http://www.armstrade.org/includes/periodics/news/2015/1009/171031600/detail.shtml, 9 October 2015, 'Yurii Borisov: prosrochennyi dolg po gosoboronzakazu snizhen na 80 mlrd. rublei'.

25 May 2014 but signed off by the President only in January 2015.[63] Its cost has not been revealed. According to Rogozin, there are 640 models of armaments and military hardware dependent on component imports from NATO and EU countries and the intention is to substitute the inputs for 571 of them by 2018.[64] Some positions, he acknowledges, will be difficult to cover, in particular radiation-resistant electronic components for space use and the nuclear industry, and this would take longer.[65] However, in August 2015 Rogozin noted that the import substitution programme relating to NATO and EU countries relates to more than 800 models of armaments, military and special hardware and will extend to 2021, but by then it will address only a very small number of cases. The schedule is for 90 per cent of cases to have been resolved by 2018.[66] These statements are not necessarily at variance as they may involve alternative indicators for the programme's implementation.[67] According to Borisov, by October 2015 components for 55 models of armament had been substituted of a total 127 planned for the year.[68]

Clearly, not all inputs currently obtained from NATO and EU member countries will be manufactured in Russia. In some cases, notably for electronic components, they can be imported from Belarus and Asian economies. In August 2014 it was reported that over the next two–three years while domestic production is being organised on an import substitution basis, China would play a significant role as a source of military and space specification electronic components, with annual imports of at least $1 billion, replacing much of $2 billion a year previously obtained from the USA.[69] Also in relation to electronic components there is the issue of redefining what constitutes a 'domestic producer', as acknowledged by Sergei Khoklov, director of the department of the radio-electronics industry of the Ministry of Industry and Trade. In a presentation of October 2014 he indicated that this was a policy option and also presented data on the extent of foreign dependence as envisaged at that time. For the radio-electronics industry as a whole in 2014 79 per cent of the market was accounted for by imports and the aim then was to reduce the share to 59 per cent by 2018 and 44 per cent by 2020. In the

[63] http://www.rg.ru/2015/05/26/programma-anons.html, 26 May 2015; Mukhin, Vladimir (2015) 'Sanktsii sryvaiut gosprogrammu vooruzhenii', *Nezavisimaia gazeta*, 22 January.
[64] http://www.vpk.ru, 2 July 2015, 'Rossiiskii OPK preodoleet zavisimost ot ukrainskikh obraztsov k 2018 godu' (original Interfaks-AVN).
[65] http://ria.ru/defense_safety/20150529/1067144746.html, 29 May 2015 (Rogozin at Vladimir economic forum).
[66] http://government.ru/news/19246/, 11 August 2015, 'Pervoe zasedanie Pravitelstvennoi komissii po importzameshcheniiu'.
[67] The above-mentioned 640 may exclude models of 'special' hardware.
[68] http://www.armstrade.org/includes/periodics/news/2015/1009/171031600/detail.shtml, 9 October 2015, 'Yurii Borisov: prosrochennyi dolg po gosoboronzakazu snizhen na 80 mlrd. rublei'.
[69] Cheberko, Ivan (2105) 'Rossiia zakupit kitaiskuiu mikroelektoniku na $2 mlrd', 6 August. This will involve close cooperation with the China Aerospace Science and Industry Corp, CASIC.

specific case of integrated circuits, the equivalent market shares were 80, 60 and 45 per cent respectively.[70]

Meanwhile, as the import substitution programmes are being implemented, stocks of imported components are being run down and problems are appearing. In the section below on specific weapons systems, examples are provided, notably the inevitable delay in completing a number of surface ships, in particular frigates, difficulties in building the planned number of helicopters, the halting of assembly of An-140 and An-148 aircraft, and some possible delays in securing volume production of some new armoured vehicles. Rogozin has noted another problem, which may extend to military satellites, namely that sanctions are making it difficult to introduce into use a new generation of GLONASS navigational satellites.[71]

4.4 Organisation and funding

In August 2015 a new government commission for import substitution was formed, chaired by Prime Minister Dmitrii Medvedev, with two sub-commissions, one for the civilian economy, chaired by Arkadii Dvorkovich, the other for the defence sector, chaired by Dmitrii Rogozin. They will be concerned with overall policy and the coordination of measures, in particular those relating to state procurement policy. According to Rogozin, his sub-commission will also deal with dual-use items, which probably means that its brief will include machine tools and other production technology, plus electronic components.

As noted above, budget funding for import substitution measures in the defence industry will form a sub-programme 'Stimulating the development of the defence-industrial complex' of the new state programme, 'Development of the OPK' in the federal budget for 2016 and beyond. It will have four components: R&D for import substitution of technologies and components; state support for enterprises undertaking import substitution of technologies and components (which will include budget allocations to increase the charter capital of both 'Saturn' and 'Zvezda-reduktor', the principal enterprises engaged in efforts to replace Ukrainian ship engines and power trains), state support for the cadre potential of the defence industry; and state support for the financial-economic stability of

[70] Khoklov, Sergei (2014) 'Perspektivy razvitiia otechestvennoi radioelektronnoi promyshlennosti', Yalta, October, Powerpoint presentation, slide 7. The 'domestic producer' measure could open the way to designating some advanced microchips produced in, for example, Taiwan as 'Russian', see Kolomychebko, Mariia and Novyi, Vladislav (2015) 'Taivanski chipy primut za rossiiskie', *Kommersant*, 9 June.

[71] http://transcript.duma.gov.ru/mode/4314 (Stenogramma zasedanii 1 iiulia 2015g) (D. Rogozin, State Duma 'government hour', 1 July 2015).

enterprises.[72] Unfortunately, like most of the new state programme, this sub-programme is likely to be highly classified.

[72] Prikaz Minfin Rossii, No 90n, 8 June 2015, 'O vensenii izmenenii v Ukazanii o poriadke primeneniia biudzhetnoi klassifikatsii Rossiiskoi Federatsii, utverdzhennye prikazom Ministerstvo finansov Rossiikoi Federatsii ot 1 iiulia 2013 g. No 65n' (published http://minfin.ru/common/upload/library/2015/07/m, 8 July 2015, pp. 144–145 and 561.

5 The next state armament programme to 2025

In September 2012 Rogozin noted that work had started in the government on the next state armaments programme, GPV-2025, and in January 2013 a timetable for its drafting was discussed by the VPK.[73] This was later approved, with an expectation that a draft would be presented to the President in July 2015 enabling approval by the end of the year.[74] In September 2014 Putin convened a high-level meeting on the drafting of the new programme. It was here that he announced his decision to take over leadership of the VPK, with Rogozin as deputy chair and Yurii Borisov, deputy defence minister for armaments, as secretary. He underlined that the new programme must be based on a clear analysis of the security threats facing the country and also on a realistic forecast of the development of the economy.[75]

The next issue to surface was the impact of sanctions and the end of supplies from Ukraine. After a meeting on import substitution in the defence industry, deputy chair of the VPK, Oleg Bochkarev, said that the new situation would be taken into account in drafting GPV-2025 and acknowledged that there could be delays in producing some complex new weapons systems in so far as it would take time to organise the domestic production of the required electronic components.[76] However, he did not think this would lead to any reductions in the defence budget. Before the end of the year, the expected volume of funding under the new programme began to be clarified. The MOD revealed that a total of 55 trillion roubles had been considered but after completing work on rationalising the range of armaments and military hardware to be procured it had proved possible to reduce the sum to 30 trillion roubles.[77] According to Yurii Borisov, the 'tipazhnost' (nomenclature of models) of armaments and military hardware has been reduced by 36 per cent.[78] He also revealed that the new GPV will include state capital investment related to preparing infrastructure for the deployment of new armaments and also some costs of developing the production base of

[73] http://www.rbc.ru/rbcfreenews/20120907145930.shtml, 7 September 2012; Vladykin, Oleg (2013) 'Vooruzhenie po chetkim pravilam', *Nezavisimaia gazeta*, 31 January.
[74] http://vpk-news.ru/articles/16594, 3 July 2015.Note, GPV-2020 was approved on 31 December 2010.
[75] http://www.kremlin.ru/events/president/news/46589, 10 September 2014, 'Soveshchanie po voprosu razrabotki proekta gosprogrammy vooruzheniia na 2016–2025 gody'.
[76] Vladykin, Oleg (2014) 'Sokratit voennyi biudzhet ne dadut', *Nezavisimaia gazeta*, 27 October.
[77] http://function.mil.ru/news_page/country/more.htm?id=12004148@egNews, 19 December 2014, *Otchet na rasshirennom zasedanii kollegii Minoborony Rossii ob itogakh deiatelnosti za 2014 g.*, pp. 3–4.
[78] *Izvestiia*, 12 January 2015, 'Pri umensheniia nomenklatury vooruzheniia na 36% sekonomim 30 trln rublei'.

enterprises previously covered by the Ministry of Industry and Trade. He also hinted that reducing the costs of servicing was an important consideration in reducing the range of equipment and it can be speculated that this may be linked to the gradual transition to lifetime contracts for new armaments.

The funding of GPV-2025 was discussed at a meeting of the VPK on 20 January 2015 attended by the top military leadership plus the ministers of finance and the economy. Putin made it clear that, notwithstanding the difficult security situation, the development of the military had to be realistic, in accordance with the economic situation and financial possibilities of the country, and that no new arms race was envisaged. [79] After the meeting, according to *Kommersant*, sources in the government were speaking of 20 trillion roubles being allocated to the new programme, but Rogozin indicated that no final decision had been taken as the macroeconomic situation was so fluid.[80]

It soon became apparent that not all was going to schedule. It is likely that there was reconsideration because of the uncertain state of the economy, making it difficult to produce a dependable forecast to 2025, essential for producing a long-term budget strategy, and also the impact of the Ukraine crisis. In addition, as acknowledged by Borisov, the price parameters of the state defence order, 2015–2017 (and presumably the early drafts of GPV-2025) have been rendered inaccurate by the sharp depreciation of the rouble, which has made imported components more expensive.[81] But another factor may have been problems encountered in completing major new arms development programmes, including rising costs. In the event, it was reported in February 2015, without any official confirmation, that it had been decided to approve the new GPV not in 2015, but in 2018, in effect extending GPV-2020 by three years. The decision was apparently taken at a session of the VPK chaired by Putin on 20 January 2015.[82] This may not have been entirely unexpected. Putin himself, as prime minister, had raised the possibility in 2011 that GPV-2020 could be prolonged, delaying the adoption of its successor. Speaking in Yekaterinburg, he made it clear that 20 trn roubles was to be spent on the GPV and added that the time period over which this fixed sum of money could be spent was flexible, 'to 2020, 2021, may be 2022'.[83] In May 2013 Anton Siluanov, finance minister, revealed that MOF had been in discussion with the MOD about a possible delay of part of the spending under GPV-2020 by

[79] http://www.kremlin.ru/events/president/news/47493, 20 January 2015, 'Zasedanie Voenno-promyshlennogo komissii'.
[80] Safronov, Ivan (2015) 'Gonki robotov s vooruzheniami', *Kommersant*, 21 January.
[81] As f.n. 60. For the role of price increases as a factor, see also, Sarkisiants, Sergei (2015) 'Voina budet ekonomnoi', *Ekspert*, No. 11, 7 March.
[82] Safronov, Ivan and Butrin, Dmitrii (2015) 'Vooruzheniia vstupil v boi vozrazheniami'. *Kommersant Daily*, 19 February; Vladykin, Oleg (2015) 'Voennye soglasuiatsia na minimalnyi sekvestr', *Nezavisimaia gazeta*, 27 February. Date of the decision, TS VPK, *Ekonomika VPK Rossii*, No. 1, January–March 2015, p. 14.
[83] http://premier.gov.ru/events/news/1571, 30 June 2011

from two to four years. This would mean that the serial production of some new models of armaments would begin later than originally envisaged within the framework of GPV-2025. The MOD was apparently willing to consider this option, a source within it acknowledging that some 'super-optimistic' indicators entered into GPV-2020.[84] A particular concern was an unrealistic schedule for new naval ships. At a meeting on the implementation of GPV-2020 for the navy in July 2013 Putin made it clear that he had no objection to the postponement of the handover of some new vessels to a later date, within the framework of GPV-2025.[85] Thus the ground was prepared for a reconsideration of procurement schedules well in advance of early 2015.

In May 2015 the postponement of the new programme's start was finally confirmed by Vasilii Burenok, until recently director of the MOD's 46th TsNII, responsible for drafting the GPV: 'At the present time a new GPV is being elaborated. In connection with the moving of the time period of its action it will be called "GPV for the years 2018–2025"'.[86] Meanwhile, work continues on the drafting of the new GPV but one senses that many decisions are on hold awaiting a more stable and predictable economic situation.

[84] Safronov, Ivan (2013) 'Gosprogramma vooruzhenii ostaetsia na sverkhsrochnuiu', *Kommersant Daily*, 23 May.
[85] Nikolskii, Aleksei (2013) 'Ekonomiia po-flotski', *Vedomosti*, 30 July.
[86] Burenok, Vasilii (2015) 'Lovushka dlia supergeroia', *Voenno-promyshlennyi kurer*, No. 19, 27 May.

6 The implementation of the State Armament Programme by service of the MOD armed forces

This chapter discusses the principal outcomes and problems of the GPV by service. The Appendix contains tables (16 to 21) that provide all the data for this overview of arms procurement by service of the Russian armed forces over the years 2010 to 2015. The implementation of GPV-2020 began in 2011; here 2010 is shown to provide a base year. The tables show, when data are available, the planned procurement of weapon systems under the annual GOZ and actual implementation for each year.

6.1 ICBMs and space systems

A number of conclusions can be drawn from the data. The most successful implementation has been in the Strategic Nuclear Forces (RVSN) (Table 16). Focusing on the 'Yars' ICBM, the number of procured annually has risen steadily. Two development programmes for new systems are proceeding as scheduled, the 'Sarmat' heavy liquid-fuelled missile and the 'Barguzin' rail-based launcher, which will carry the 'Yars'. After initial teething trouble the 'Bulava' sea-launched missile is now entering service on the new 'Borei' class submarines. Meanwhile, older submarines have been refitted with the latest 'Sineva' and 'Lainer' versions of a proven missile. Evidence on military space apparatus is far from complete but suggests an erratic performance, with some failed launches. With respect to strategic missiles and space systems the evidence to date does not indicate any problems arising from the breakdown of supplies from Ukraine and Western sanctions, but as discussed above the satellite programme could be delayed by limited access to advanced electronic components.

6.2 Air defence

There is more evidence of problems and delays in the procurement of armaments for the air and space defence forces (Table 17). The S-400 system is entering service steadily but it is not clear that the pace of adoption is adequate to reach the 2020 goal of 56 division sets. The new S-500 appears to be behind schedule. The original goal was 2015 for its first appearance but now it seems unlikely to be ready for procurement until 2017 at the earliest, making the 10 sets by 2020 a difficult target. The new 'Vitiaz' medium range system is also yet to appear and it is not clear that deliveries will commence in 2016 as expected in early 2014. The

short-range ‘Morfei’ system was to have been adopted in 2013, then 2015, but is now rarely mentioned.

Meanwhile, work continues actively on upgraded versions of older systems such as the ‘Pantsir’, ‘Buk’ and ‘Tor’, possibly because modernisation offers a lower cost and more dependable, option. New ‘Voronezh’ missile early warning radars are being built and this programme appears to be on schedule.

6.3 Aircraft, helicopters and UAVs

Compared with 2010 the number of new aircraft procured annually by the Air Force has increased to a significant extent (Tables 18 and 19). This has been a relatively successful direction of work under GPV-2020, both for fixed wing planes and helicopters. However, the new aircraft entering service are overwhelmingly modernised versions of well-established systems, not new models. In recent times there has been mounting evidence that problems and rising costs are leading the postponement of genuinely new programmes featured in GPV-2020. Firstly, the T-50 fifth generation fighter programme is now behind schedule and still lacks the new engine under development for it. The decision by the MOD to acquire an initial batch of only 12 and to increase orders for the much cheaper Su-35 provide clear evidence that not all is going as envisaged in GPV-2020. The same is true of the PAK DA strategic bomber programme, which has clearly been deprioritised, with a decision to build an upgraded version of the Tu-160 as an alternative, although this will also be complex and costly. The PAK TA military transport programme has also been side-lined, attention being focused now on building the ‘Il-76MD-90A’ heavy transport. The end of supplies from Ukraine has already had an impact on the fulfilment of GPV-2020: the building An-140 and An-148 in Russia has been curtailed. It has also affected the volume of procurement of helicopters. Engines for Ka-52 and Mi-28N combat helicopters are now manufactured in Russia but the volume of domestic engine production is not adequate to meet all needs, leading to a sizeable reduction in the state defence order for 2015 – 88 helicopters as opposed to 130 in 2014. As with fixed wing planes, the helicopters being procured under GPV-2020 are predominantly of older, established, design, with very few new developments. On exception is the Ka-52K for ship use, developed specifically for the ‘Mistral’ class helicopter-carrying assault vessel, the acquisition of which has fallen victim to sanctions.

A matter of concern for the military, apparently not given high priority in the original GPV-2020 as approved at the end of 2010, is the development and production of modern unmanned aerial vehicles (UAVs, or drones). Russia still lacks a strike UAV, although models are under development, in particular a heavy strike system scheduled for procurement from 2017–2018. It remains to be seen whether new UAV development programmes will be affected by the breakdown of links with Ukraine, which manufactures power units for UAVs, and sanctions,

which may limit access to electronic components essential for guidance and control systems in an advanced technology field in which Russia lags behind the USA, Israel and other leaders. However, the manufacture of basic reconnaissance UAVs has developed quite rapidly and the range of types entering service continues to expand. Work is also underway on counter-UAV technologies, a new form of electronic warfare, a field in which Russia has generally acknowledged strength.[87]

6.4 Ground force systems

To date the Ground Forces have not received much new equipment under GPV-2020 (Table 20). As the specialists of CAST in Moscow have correctly observed, the lack of priority for the ground forces, in contrast to the generous treatment of the navy, is a surprising feature of the programme given the real security issues facing present-day Russia.[88] In advance of the completion of new development programmes, the army has been receiving modernised older models of tanks and armoured vehicles, although a few newer models of the latter are beginning to be acquired. The same applies to artillery systems. The procurement of one major item of equipment, the 'Iskander' tactical missile system, is on schedule in accordance with GPV-2020. Much now depends on the fate of three priority development programmes for the creation of new platforms for ranges of armoured systems: the 'Armata', the basis of a novel main battle tank, the 'Kurganets', tracked armoured vehicle, and 'Bumerang', wheeled armoured vehicle. They are all scheduled to reach the forces on a trial basis within the next two years and enter regular production from 2017–2018. However, there are concerns about the high cost of these new systems and there is a possibility that the 'Bumerang' will be delayed because of sanctions. It is clear that the GPV-2020 goal of 2 300 new main battle tanks will not be met. The airborne troops are beginning to receive some new equipment, the BMD-4M and BTR-MD. In addition, elite forces are now being equipped with the advanced 'Ratnik' infantry combat system.

6.5 Maritime systems

It is the navy, the principal recipient of funding under GPV-2020, that has experienced some of the most serious problems under GOV-2020 and now the delivery of new ships is being affected by the Ukraine crisis, from both the ending of Ukrainian inputs and NATO/EU sanctions (Table 21). The submarine programme has been running behind schedule and it is not clear that all 8 'Borei' class strategic missile submarines will be handed over to the navy by the end of

[87] http://ria.ru/technology/20151029/1310134857.html#ixzz3q26Kv6BG, 29 October 2015, 'V Rossii sozdany obraztsy kompleksov radioelektronnoi borby s BLA'.
[88] CAST (2015), p. 36.

2020. The ‘Yasen’ class multi-role submarines are even more behind schedule and very few ‘Lada’ class diesel electric are likely to be completed. The only submarine programme being implemented with some success is the building of older ‘Varshavianka’ class diesel-electric models. Work has not started on building the new ‘Lider’ class destroyers and both the corvette and frigate programmes are being disrupted by the Ukraine crisis, the former by the non-delivery by Germany of diesel power units; the latter by the end of deliveries of gas turbines produced in Ukraine. The lack of German power units will also affect other programmes, in particular the building of ‘Buian’ class small artillery ships. Finally, the navy is now considering the future building of an alternative to the ‘Mistral’ class landing craft denied to Russia by sanctions. In addition, it is clear the shipbuilding programme has been subject to significant cost increases. The authorities have recognised for some time that quite a few vessels scheduled for delivery by 2020 will now be completed for handover under GPV-2025.

6.6 Other systems

In the detailed tables it has been possible to present intentions and outcomes for armaments that can be readily quantified but this leaves other aspects of the re-equipment of the military to one side, in particular the progress made in developing and diffusing new system of communications, with advances in digitalisation, and systems for management and control. The new National Centre for Defence Management in Moscow and its counterparts now being established in each military district represents a significant advance, with transition to a new generation of technology for the command and control of the armed forces.[89] It should also be noted that Russia is developing new competencies, for example, in the military applications of robotics, for which a new national research centre has been established.[90] It is too early to make an assessment of these less easily quantified aspects of Russia’s military modernisation but evidence should become available over the next few years.

[89] See the author’s unpublished paper ‘The National Defence Management Centre of the Russian Federation. A Research Note’, November 2014, which is available on request.

[90] The MOD’s Main Research and Test Centre for Robot Technology (GNIITs RT) in Moscow, http://ens.mil.ru/science/SRI/infrmation.htm?id=11397@morfOrgScience.

7 Concluding remarks

At the end of 2010, based on a forecast of GDP growth to at least six per cent a year over the period of its implementation, the Russian leadership adopted a highly ambitious state armaments programme to the year 2020. This was to be a once and for all catch up, making good the almost total lack of procurement of new armaments over almost two decades, years when the newly independent Russian Federation could hardly afford to maintain the personnel and structures of its armed forces, let alone supply them with new equipment. It was believed that this modernisation could be achieved without a large increase in the share of GDP devoted to the military: Medvedev, then president, spoke confidently of no more than 2.8 per cent over the lifetime of the programme. In the event, economic performance turned out to be disappointing, annual average GDP growth being a mere 0.6 per cent over the period 2010–2014.[91] In these circumstances the military share of GDP rose inexorably and budgetary pressures mounted. By 2014 total military spending had reached 4.5 per cent of GDP, rising to 5.4 per cent in the amended budget for 2015.[92] But, as shown in Tables 17–22, procurement volumes increased to a significant degree and there is no doubt that Russia's military capability by the end of 2015 was of a different order than it had been only a few years earlier. It is difficult to conceive that Russia could have mounted the military action in Syria in autumn 2015 without the positive outcomes achieved in implementing GPV-2020. There has also been an appreciable revival of the country's defence industry, not as strong an actor as in Soviet times but nevertheless today a sector of influence on policy, headed by the energetic and forceful Dmitrii Rogozin. At a time of very modest overall industrial growth the defence industry, with rapidly growing expenditure on the state defence order, has enjoyed a surge of growth, thereby serving to some extent as a driver of the economy.

Not surprisingly, over time strains have mounted. With a stagnant or declining economy, the budgetary burden of the military has become difficult to sustain and the signs are that spending will now stabilise, with a declining GDP share. The draft federal budget for 2016 sent to the State Duma for approval in late October 2015 provides for spending on 'national defence' of 4.0 per cent of GDP, compared with 4.3 per cent in the amended budget for 2015. Furthermore, budget spending on the state defence order has been reduced by approximately 200 billion roubles, although state guaranteed credits to the same amount are being

[91] http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG, accessed 17 August 2015.
[92] See the authors' paper, 'Military spending in the draft law amending to the Russian 2015 federal budget', April 2015, available http://www.sipri.org/research/armaments/milex/publications/unpubl_milex/research-notes-on-russian-military-expenditure-by-prof-julian-cooper

authorised.[93] In addition, the defence sector is experiencing the inevitable problems of attempting to implement simultaneously a set of challenging development programmes for new generation systems, with ever rising costs. To make matters more difficult, some programmes are now being disrupted by the breakdown of deliveries from Ukraine and the sanctions imposed by NATO and EU member countries. The growth of output of the defence industry now appears to be moderating: according to Rosstat, during the first nine months of 2015 the output of 'ships, flying and space apparatus, and other transport means', a statistical reporting category that must include a sizeable part of the defence sector, fell by almost 10 per cent compared with the same period in 2014.[94] In these circumstances it is perhaps not surprising that Russia's political, economic and military leaders have come to the conclusion that the pace of renewal will have to be moderated at least for a period, during which it will be hoped that the economy will begin to resume healthy growth. The decision to delay the start of the new state armaments programme to 2025 is an understandable measure in highly uncertain times. But for the first five years of GPV-2020 no doubt success will be claimed. The share of modern armaments in the holdings of the armed forces will exceed the target of 30 per cent and the total spend of well over 6 trillion roubles will be larger in nominal terms than the 5.9 trillion roubles envisaged when the programme was adopted at the end of 2010.

Notwithstanding the far from vibrant state of the Russian economy, the negative impact on the defence industry of the Ukraine crisis, and the inevitable problems associated with major new development programmes, there is no doubt that the weaponry of the country's armed forces has undergone quite significant modernisation during the past five years. There has been a significant renewal of the strategic missile forces, quite successful upgrading of the country's air defence system, notably by the procurement of the S-400 system, and transition to sizeable annual additions to the Air Force's stock of fixed wing planes and helicopters. Less successful has been the modernisation of the equipment of the ground forces, although this could change in the next few years as newly developed systems enter volume production, and of the navy, the service most affected by the breakdown of deliveries from Ukraine.

To answer the question posed in the introduction, have the Russian armed forces received new weapons of sufficient quantity and quality that it can be said that the country's military capability has been genuinely enhanced, the conclusion must be in the affirmative. Russia is back on the world stage as a major military actor.

[93] Julian Cooper, 'Military expenditure in the Russian federal budget for 2015 and the draft budget for 2016', unpublished paper, October 2015.

[94] http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/enterprise/industrial/#, Indeksy

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CAST (2015) *Gosudarstvennye programmy vooruzheniia Rossiiskoi Federatsii: problemy ispolnenii i potentsial optimizatsii. Analiticheskii doklad*, CAST, Moscow, April (GPV-2020, features, implementation, priorities and proposed changes).

Cooper, Julian (2012) 'Military Procurement in Russia' in McDermott, Nygren, Vendil Pallin (eds) *The Russian Armed Forces in Transition*, Routledge, pp. 170–175 (Arms procurement, the GPV and GOZ).

Cooper, Julian (2013) *Russian Military Expenditure: Data Analysis and Issues*, FOI-R--3688--SE, Stockholm, October

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Frolov, Andrei (2011) 'Ispolnenie gosudarstvennogo oboronnogo zakaza Rossii v 2010 godu', *Eksport Vooruzhenii*, No. 2 (Implementation of GOZ-2010).

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International Institute for Strategic Studies (2012) ‘Russia: Defence economics’, *The Military Balance 2012*, pp. 188–191.

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Oxenstierna, Susanne & Olsson, Per (2015*) The economic sanctions against Russia. Impact and prospects of success*, FOI-R--4097--SE, September.

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Appendix Data on implementation by service

The tables show, when data are available, the planned procurement of weapon systems under the annual GOZ and actual implementation for each year. In addition, under ‘systems and notes’, for each Table information is provided on the impact on the implementation of GPV-2020 of the breakdown of supply relations with Ukraine and of sanctions imposed by NATO and EU member countries. In some cases implementation has been affected by other factors and details are provided. By the nature of the exercise, it has been necessary to draw on a very large number of sources and these have been presented separately for each Table in order to maintain focus on the issues of significance presented under ‘systems and notes’.

In the tables in the appendixes below:

P refers to the *planned* state defence order for the relevant year;

A to the *actual* implementation of that order;

S. denotes Sanctions, .i.e. a comment relating to the impact of NATO and EU sanctions on specific weapon systems:

U. denotes Ukraine, .i.e. a comment relating to the impact of the breakdown of supplies from Ukraine on specific weapon systems.

A.1 Strategic nuclear missiles and space systems (number of units)

Table 16

Strategic nuclear missiles and space systems

	2010 GOZ	2011 GOZ	2012 GOZ	2013 GOZ	2014 GOZ	2015 GOZ	GPV-2020 Total
All strategic missiles	30+/27	36/28-30	/24-26	/28-32	40/38	50+,40+ /35	400+
ICBMs 'Topol-M' (RS-12M) 'Yars' (RS-24) 'Rubezh' (RS-26) 'Sarmat' (RS-28) 'Barguzin'(RS-24,BZhRK)	/3 -	/4 /3	/6 /3	- /15	- 22/16	- 24/	190-200 2015/16 2018/19 2019-20
SLBMs 'Sineva'-'Lainer' (R-29RM) 'Bulava' (R-20)	/16 /3-5	/c.16 /5-7	/c.10 /5-7	/c.10 /5-7	}/22 }	} 26+/ }	124-250
Space apparatus Rocket boosters launched Satellites launched	/9 /16 (3u)	/8 11/10(1u	/4 /6	/10 /18 (3u)	6/		100+

Note: u. unsuccessful launch. [.../...] planned number of units in GOZ for year/actual number procured by armed forces
c. aproximate

- ***Systems and notes***

- *Land-based intercontinental ballistic missiles*

'Topol-M' (RS-12M) ICBM (Moskovskii Institut Teplotekhniki (MIT); AO 'Votkinskii zavod')

'Yars' (RS-24) ICBM (Moskovskii Institut Teplotekhniki (MIT); AO 'Votkinskii zavod')

'Rubezh' (RS-26) ICBM (Moskovskii Institut Teplotekhniki (MIT); AO 'Votkinskii zavod')

Created on the basis of 'Yars'. Mobile only, no silo variant.[95] To enter serial production end 2015/early 2016.[96]

'Sarmat' (RS-28) heavy liquid-fuelled ICBM (Miass AO 'Gosudarstvennyi raketnyi tsentr im. akademika V.P. Makeeva'; AO 'Krasmash')

Originally, prototype scheduled to appear by May–June 2015, but later postponed to September-October.[97] Testing to begin in 2017.[98] To enter serial production in 2018–2019.[99]

'Barguzin' rail-based ICBM (RS-24, BZhRK – boevoi zhelenzodorozhnyi raketnyi kompleks) (Moskovskii Institut Teplotekhniki (MIT); AO 'Votkinskii zavod'; probably St Petersburg St KB spetsialnogo mashinostroeniia (rail-based launch unit).

Development to be completed to permit deployment by 2019–2020 to create a new rail-based division of 5 regiments, each with 6 ICBMs based on the RS-24 'Yars', 4 warheads per missile? [100]

- *Submarine-launched ballistic missiles*

'Sineva'/'Liner' SLBM (R-29MU2/R-29RMU2.1) (Miass AO 'Gosudarstvennyi raketnyi tsentr im. akademika V.P. Makeeva'; AO 'Krasmash')

'Bulava' SLBM (R-30) (Moskovskii Institut Teplotekhniki (MIT); AO 'Votkinskii zavod')

Work is now underway at MIT on a modernised version of the –Bulava'.[101]

- *Satellites*

S.[102] It is possible that the military satellite programme may be affected by sanctions in so far as significant use is made of imported electronic components.

[95] http://www.vz.ru/news/2015/9/21/768017.html, 21 September 2015, 'Demonstratsiiu MBR "Rubezh" inspektroam SShA naznachili na noiabr'.

[96] http://www.vz.ru/news/2015/4/15/740041.html, 15 April 2015, 'Nazvano vremia vykhoda raket RS-26 vseriinoe proizvodstvo'.

[97] http://vpk.name/i1324819.html, 29 June 2015, 'Nachalo ispytanii novoi rakety "Sarmat" otlozheno' (original lenta.ru).

[98] http://lenta.ru/news/2015/07/21/sarmat/, 21 July 2015, 'Ispytaniia novesishei ballisticheskoi rakety "Sarmat" nachnutsia v 2017 godu'.

[99] http://lenta.ru/news/2015/04/20/sarmat/, 20 April 2015, 'V Minoborony rasskazali o nachale proizvodstva strategichiskoi rakety "Sarmat"'.

[100] http://vpk.name/news/131534_istochnik_sostav_rvsn_na_rubezhe_20192020_godov_vyirastet_do_13_raketnyih_divizii.html, 8 May 2015, 'Istochnik: sostav RVSN na rubezhe 2019–2020 godov vyrastet do 13 raketnykh divizii' (original ITAR-TASS); Ponomarev, Vadim (2015) 'Neulovimyi "Barguzin": bolshoi siurpriz dlia SShA', *Ekspert Online*, 22 June.

[101] http://vpk.name/i145148.html, 26 November 2015, 'Korporatsiia MIT rabotaet nad modernizatsiei raketu "Bulava"'.

[102] **S.** denotes Sanctions, .i.e. a comment relating to the impact of NATO and EU sanctions on specific weapon systems.

According to one authoritative source (the deputy general designer of AO 'Inofratsionnye sputnikovye sistemy'), the limitation by the USA of delivery of electronic components had led to a delay in making satellites of 8–10 months.[103]

- ***Sources for planned GOZ and implementation***

- *All strategic missiles:*

GPV-2020 total: Putin, V. (2012) 'Byt silnymi garantii natsionalnoi bezopasnosti dlia Rossii', *Rossiiskaia Gazeta*, 20 February, htpp//www.rg.ru/2012/02/20/putin-armiya.html.

Total number procured each year: from number of identified systems.

2010P[104]: http://kremlin.ru/news/11206, 10 May 2011 (Medvedev); 2010A: http://www.kremlin.ru/news/10677, 19 March 2011 (Serdiukov); 2011P: http://www.kremlin.news/10677, 19 March 2011 (Serdyukov); 2011A: 30, http://www.function.mil.ru/for_media/press_conferences, 24 January 2012 (A. Sukhorukov); 2012A: total of named missiles; 2013A: total of named missiles; 2014P: 40+ : http:/www.kremlin.ru/news/19816, 10 December 2013; ICBMs, http:/news.kremlin.ru/news/19713/, 27 November 2013; 2014A: http://function.mil.ru/news_page/country/more.htm?id=12004148 @egNews,19 December 2014; 'Otchet na rashirennom zasedanii kollegii MO Rossii ob itogakh deyatelnosti za 2014g'; 2015P: 50+ , http://www.kremlin.ru/news/47257, 19 December 2014, (Putin); 2015A: http://function.mil.ru/files/morf/2015-12-11_MoD_board_extended_session_ RUS.pdf , 11 December 2015, 'Tezisy doklada Ministra oborony Rossiiskoi Federatsii na rashshirennom zasedanii Kollegii Minoborony Rossii'.

- *Land-based intercontinental ballistic missiles*

'Topol-M' (RS-12M) ICBM

2010A, 2011A, 2012A: Frolov, Andrei (2014) 'Ispolnenie gosudarstvennogo oboronnogo zakaza Rosssii v 2013 godu', *Eksport vooruzhenii*, No. 3, p. 40.

'Yars' (RS-24) ICBM

[103] Aksenov, P. V. (2014) 'Problemy i perspektivy importzameshcheniia na predpriiatiiakh oboronno-promyshlennogo kompleksa' in Sovet Federatsii, *Analiticheskii vestnik*, No. 27, 'O merakh po realizatsii importzameshcheniia v grazhdanskikh otrasliakh promyshlennosti v interesah ukrepleniia nationalnoi bezopsasnosti', Moscow, November, p. 21. According to Aksenov, for the Glonass-M satellite, 70–80 per cent of electronic components are of Western origin (p. 24).

[104] Hereafter, P refers to the *planned* state defence order for the relevant year; A to the *actual* implementation of that order.

GPV-2020 total: Kramnik, Ilia (2013) ’Yadernyi shchit: balans moshchi i mobilnosti’, http://www.nationaldefense.ru/includes/periodics/geopolitics/2013/0304/101610322/.

2010A, 2011A, 2012A, 2013A: Frolov (2014); 2014P: Viatkin, Yaroslav (2014) ’Armiia gotovitsia k bolshomu ryvku’, *Argumenty nedelii*, No. 2, January, p. 7; 2014A; 2015P: http://topwar.ru/64927-yubiley-raketnyh-voysk-strategicheskogo-naznacheniya.html, 17 December 2014; 2015P: http://arsenal-otechestva.ru/article/388-defense-tasks, 21 May 2015, ’Aktualnye zadachi Ministerstva oborony Rossiiskoi Federatsii’.

- *Submarine-launched ballistic missiles*

2014A total: http://function.mil.ru/news_page/country/more.htm?id=12004148@egNews,19 December 2014; ‘Otchet na rashirennom zasedanii kollegii MO Rossii ob itogakh deiatelnosti za 2014g’; 2015P: residual, total less ICBMs.

‘Sineva’/‘Liner’ SLBM (R-29MU2 /R-29RMU2.1)

2010A, 2011A, 2012A, 2013A: Frolov (2014).

‘Bulava’ SLBM (R-30)

GPV-2020 total: To 2020: *Kommersant, Business Guide*, Voenno-promyshlennyi kompleks (*Kommersant Business Guide*, No. 27, 30 May 2013), http://www.kommersant.ru/apps/90382, p. 9.

2010A, 2011A, 2012A, 2013A: Frolov (2014).

- *Space equipment – Launchers*

2010A, 2011A, 2012A, 2013A: Frolov (2014).

- *Space equipment – Satellites*

GPV-2020 total: Putin, V. (2012)

2010A, 2011A, 2012A, 2013A: Frolov (2014); 2011P: Litovkin, Dmitrii (2010), ‘Trillion rublei na reform armii’, *Izvestiia*, 9 December, p. 2; 2014 P: http://news.kremlin.ru/news/19722/, 29 November 2013, ‘Soveshchanie po razvitiiu orbitalnoi grupirovki kosmicheskikh apparatov’.

A2 Air and space defence forces

Table 17

Air and space defence forces*

	2010 GOZ	2011 GOZ	2012 GOZ	2013 GOZ	2014 GOZ	2015 GOZ	GPV-2020 Total
*Air defence systems***		/4	/3	/4	2/7c	6/	56
'S-400'							10
'S-500'							38
'Vitiaz' - PVO'		/1					
'Buk-M2'	/10	/20	/28	/24			120
'Pantsir-S1'			/4	/12			
'Tor-M1-2U'/'Tor-M2'							
'Morfei'							
Radar systems							
'Voronezh' MEWS		2/1	1/-	/1	/2	1/	
Other radar systems, inc	16/16		20/20	/c.20	/35+	/208	100
'Nebo-M'/'Niobii'				/9	6/		
'Podlet'					23/}		
'Sopka'					}		

Notes: ../... planned number in GOZ for year/actual number procured by armed forces.
* From 1 August 2015 merged with Air Force to form Aerospace Forces of Russia (VKS).
** Division sets unless otherwise indicated. Eight missile launchers per division. A regiment (*polk*) is two divisions.
c. aproximate.

- ***Systems and notes***

- *Air defence systems*

'S-400' ('Triumf') (AO 'Kontsern vozdushno-kosmichekoi oborony "Almaz-Antei"')

There is still a question as to the range of the missile currently available for use with the S-400. According to a Chinese source (China is interested in buying the system) at present it only has the 48N6DM missile with a range of 350 km (as the

S-300PMU-3), not the 400 km 40N6 missile, as of September 2015 still being tested.[105]

'S-500' ('Triumfator-M'/'Prometei') (AO 'Kontsern vozdushno-kosmichekoi oborony "Almaz-Antei"')

Development to be completed by 2017.[106] In August 2014, air force commander-in-chief V. Bondarev said the forces would receive it from 2016; the original goal was 2015.[107]

S-350 'Vityaz' (medium range, replacement of S-300P, 12 missiles per launch unit) (AO 'Kontsern vozdushno-kosmichekoi oborony "Almaz-Antei"')

Under development; in GPV deliveries to begin in 2016, with production starting in 2015.[108] In July 2015 it was reported that deliveries to the forces will begin soon.[109]

'Buk-M2' (NPO 'Vysokotochnye kompleksy' – KB priborostroeniia, Tula)

'Pantsir -S1' (NPO 'Vysokotochnye kompleksy' – KB priborostroeniia, Tula)

'Tor-M1-U2' (AO "'NI elektromekhanicheskii institut'; AO 'Izhevskii elektromekhanicheskii zavod "Kupol"')

'Morfei' (short range) (AO 'Kontsern vozdushno-kosmicheskoi oborony "Almaz-Antei"')

Under development, was to have been adopted from 2013, then 2015.[110]

- *Radar systems*

'Voronezh-M'/'Voronezh-DM' missile early warning system (Moscow Kontsern 'RTI sistemy')

The principal radars of the ground based missile early warning system. As of August 2015, on combat duty were 'Voronezh' of Leningrad oblast, Kaliningrad oblast, Armavir (Krasnodar krai) and Usole-Sibirskoe (Irkutsk oblast); under

[105] http://vpk.name/i140695.html, 17 September 2015, 'S-400. Dve problemy dlia Kitaia'.
[106] *Natsionalnaia oborona*, No. 2, February 2015: http://www.nationaldefense.ru/includes/periodics/ /main/theme/2015/0224/143315177/detail.shtml, 'Yurii Borisov: "V strukture gosoboronzakaza svyshe 65% vydeleno na seriinye zakupki novykh obraztsov"'.
[107] http://vpk.name/i115154.html, 11 August 2014, 'ZRS S-500 nachnut postupat vvoiska v 2016 godu'; Viatkin, Yaroslav (2014) 'Kto prikroet nashe nebo?', *Argumenty nedelii*, 27 June, p. 17.
[108] Tretiakov, Petr (2014) 'Proizvodstvo zenitnykh kompleksov S-350 "Vitiaz" nachinaetsia vsledushchem godu', 22 January, http://www.vedomosti.ru/tech/2014/01/22/21674331.
[109] http://www.vpk.news.ru/news/25927, 2 July 2015, 'Rossiiskaia armiia vskore poluchit na vooruzhenie ZRS S-350 "Vitiaz"'.
[110] http://ria.ru/defense_safety/20130424/934250446.html, 24 April 2013, 'Kompleks PVO "Morfei" budet priniat na vooruzhenie v 2015 godu'.

construction at Eniseisk, Barnaul and Orsk. New ones will be built near Vorkuta and in Murmansk oblast.[111]

Other radar systems

- ***Sources for planned GOZ and implementation***

- *Air defence systems*

'S-400' ('Triumf')

GPV-2020 total: http://www.vedomosti.ru/newspaper/2011/02/25/255644, 25 February 2011.

2011A, 2012A, 2013A: Frolov (2014). However, one informed source gives 2012A as 4, http://army-news/2013/01/armiya_rossii-itogi-perevooruzheniya-2012/, 6 January 2013 and claims that by January 2013 there were 5 regiments in all; 2014P: http://www.armstrade.org/includes/periodics/news/2014/0109/103522049/detail.shtml, 9 January 2014; 2014A: 7 complexes: http://function.mil.ru/news_page/country/more.htm?id=12004148@egNews, 19 December 2014; 'Otchet na rashirennom zasedanii kollegii MO Rossii ob itogakh deyatelnosti za 2014g'.

2015P: http://ria.ru/defense_safety/20141219/1039245777.html, 19 December 2015, 'Shoigu: tri polka poluchat S-400 v 2015 godu'; 2015A: http://www.rg.ru/2015/11/10/s-400.html, Yurii Gavrilov, '"Triumf" bet v desiatku' (by end 2015 a total of 20 divison sets in service).

'S-500' ('Triumfator-M'/'Prometei')

GPV-2020 total: http://www.militaryparitet.com/teletype/data/ic_teltype/9799/, 24 February 2011 (original RIA Novosti)

S-350 'Vityaz'

GPV-2020 total: Putin, V. (2012).

'Buk-M2'

2011A: Frolov (2014).

'Pantsir -S1'

[111] http://www.arms-expo.ru/news/vooruzhenie_i_voennaya_tekhnika/v_rossiya_nachnetsya_stroitelstvo_eshche_dvukh_rls_tipa_voronezh/, 16 August 2015.

GPV-2020 total: 100, http://militaryrussia.ru/blog/topic-558.html, ‘Kompleks 96K6 Pantsir-S/Pantsir-S1 – SA-22 GREYHOUND’, 19 October 2013, (6 ‘Pantsir-S1’ = 1 division). 120?

2010A, 2011A, 2012A, 2013A: as ‘Buk-M2’. Note, one source gives 2012A as 10, http://army-news/2013/01/armiya_rossii-itogi-perevooruzheniya-2012/, 6 January 2013.

‘Tor-M1-U2’

2012A, 2013A: Frolov (2014).

- *Radar systems*

‘Voronezh-M’/‘Voronezh-DM’ missile early warning system

2014–2020: 7 into use, http://www.kremlin.ru/news/19717, 28 November 2013, Soveshchanie na razvitiiu sistemy vozdushno-kosmicheskoi obonony (Putin).

2011P, 2012P: 2011, Litovkin, Dmitrii (2011) ‘Rossiya vosstanovit protivoraketnoe pole k 2012 godu’, http://www.izvestia.ry/news/496752, 9 August; 2011A, 2012P: http:// www.argumenti. ru/army/online/ 2012/01/151644, 22 January 2012; 2013A: http://www.vz.ru/news/2014/2/14/672557.html, 14 February 2014, ‘Shoigu: Minoborony razvorachivaet dopolnitelnye RLS novogo pokoleniya’.

2014A:
http://vpk.name/news/124232_armiya_rossii_uvelichila_svoi_boevyie_vozmozhnosti_v_13_raza_za_2014_god.html, 31 December 2014; 2015P: http://min-oboron.ru/novosti/ministr-oborony-rossii-general-armii-sergej-shojgu-provel-pervoe-v-novom-godu-selektornoe-soveshhanie-s-rukovodyashhim-sostavom-vooruzhennyx-sil.html, 21 January 2015.

Other radar systems

Total

GPV-2020 total: http:// www.argumenti.ru/army/online/2012/01/151644, 22 January 2012.

2010P: http://armstass.su/?page=article&aid=93156&cid=25, 24 February 2011.

2010A, 2012A: Frolov, Andrei (2013) ‘Ispolnenie gosudarstvennogo oboronnogo zakaza Rosssii v 2012 godu’, *Eksport vooruzhenii*, March–April, p. 40; 2012P: http:// www.argumenti.ru/army/online/ 2012/01/151644, 22 January 2012; 2013A: http://www.armstrade.org/incliudes/periodics/news/2014/0109/103522049/detail.shtml, 9 January 2014. ‘Nebo-M’, http://vpk.name/i103653, 17 January 2014, ‘Radiolokatsionnaia stantsiia 55Zh6UM “Niobii”’ (The ‘Niobii’ is a development of the ‘Nebo-M’).

2014A: http://rosrep.ru/otrasl/index.php?=y&ELEMENT_ID=9821&SECTION_ID=7, 20 May 2015.

2014P: ‘Nebo-M’, ‘Podlet’, ‘Sopka’: as total, 2013.

2015A: http://function.mil.ru/files/morf/2015-12-11_MoD_board_extended_session_RUS.pdf , 11 December 2015, ‘Tezisy doklada Ministra oborony Rossiiskoi Federatsii na rashshirennom zasedanii Kollegii Minoborony Rossii’.

A3 Air forces: air force (VVS) and naval aviation

Fixed wing aircraft

Table18. Air force equipment: air force (VVS) and naval aviation

	2010 GOZ	2011 GOZ	2012 GOZ	2013 GOZ	2014 GOZ	2015 GOZ	GPV-2020 Total
Fixed wing aircraft – all	28/23	35/28	/35	65/67	120/104	126/	600, 850
Combat aircraft Fighters	/21	28/19		/54			
PAK-FA T-50, 5th gen.	/1pt	/2pt	/1pt	/1pt	-	4pt/	52,12
Su-35S	/4	2/2	/8	12/-	24/24	14/	96
Su-30M2				/3	/8	5/	
Su-30SM	/4	3/-	2/2	14/14	15/21	30/	72
Su-27SM3		8/8					12
MiG-35S	/3						37;30
MiG-29SMT							16+
MiG-29K/KUB				/4	10/10	10/	24
PAK DP (development)							2025
Strategic bomber PAK DA (development)							2021–2022
Frontal bomber Su-34	/4	6/5	10/10	/14	16/18	16/	129; 140
Ground attack aircraft Su-25UBM							12
Trainers Yak-130 trainer	/4	8/8	15/15	/20	27/	30,12/	67;80
Yak-152 light trainer						**U**	150
Transport, passenger and special aircraft						**U**	60/17/2/-
An-70 transport							20,10
An-124-200 transport		1/1	2/2	/3	1/2		10;12,1
An-140-100 trans/pass				1/1	4/4	4/2	5
		/4	/3	/4	/2	2,3/	20;15
						/4	

An-148-100E passenger	/1	1/ 2/	2/2	/1 /1	/1		39;60 100/62,
Il-476/76MD-90A	/1						<
Il-112V light transport					1/		30
L-410UVP-E20 pass.							
Tu-214ON/Tu-204ON							
Tu-154M passenger							2024
Il-62M passenger							
Be-200 amphibious							
Il-78M-90A refuelling							
PAK TA (development)							

Notes: .../... planned number in GOZ for year/actual number procured by armed forces.
U denotes Ukraine, .i.e. a comment relating to the impact of the breakdown of supplies from Ukraine on specific weapon systems.
pt denotes prototype.

- ***Systems and notes***

- *Combat aircraft*

PAK FA (T-50) 5th generation fighter (Perspektivnyi aviatsionnyi kompleks frontovoi aviatsii) (AO 'Obedinennaia aviatsionnaia korporatsiya' (OAK) – Kompaniia 'Sukhoi', 'Komsomolskii-na-Amure aviatsionnyi zavod')

Original GPV-2020 total 52, 2016–2018 8 per year, 2019–2020 14. But the MOD now plans an initial batch of 12 and then will determine the final number, possibly less than 52.[112] According to Yu Borisov, 'in coming years' only 12 will be built, but orders for cheaper Su-35 fighters will increase.[113] Serial production from 2017.[114] The T-50 still does not have a new engine. A new one is under

[112] Safronov, Ivan (2015a) 'Piatoe s minusom pokolenie', *Kommersant Daily*, 24 March, p. 2.
[113] http://vpk.name/i135243.html, 3 July 2015, 'Minoborony sorashchaet zakupku istrebitelei piatogo pokoleniia T-50' (original RIA Novosti).
[114] http://www.vpk.news.ru/news/25422, 28 May 2015, 'Seriinye postavki PAK FA nachnutsia v 2017 godu'.

development but is not expected to be ready for flight testing until 2018, not 2017 as planned earlier.[115]

Su-35S (AO 'Obedinennaia aviatsionnaia korporatsiia' (OAK) – Kompaniia 'Sukhoi', 'Komsomolskii-na-Amure aviatsionnyi zavod')

Su-30MK2 (AO 'Obedinennaia aviatsionnaia korporatsiia' (OAK) – Kompaniia 'Sukhoi', 'Komsomolskii-na-Amure aviatsionnyi zavod')

Su-30SM (AO 'Obedinennaia aviatsionnaia korporatsiia' (OAK) – 'Korporatsiia Irkut, 'Irkutskii aviatsionnyi zavod')

Su-27SM3 (AO 'Obedinennaia aviatsionnaia korporatsiia' (OAK) – Kompaniia 'Sukhoi', 'Komsomolskii-na-Amure aviatsionnyi zavod')

MiG-35S (AO 'Obedinennaia aviatsionnaia korporatsiia' (OAK) – AO 'Rossiiskaia samoletostroitelnaia korporatsiia MiG'; 'Nizhnii Novogorod aviatstroitelnyi zavod "Sokol"')

MiG-29SMT (AO 'Obedinennaia aviatsionnaia korporatsiia' (OAK) – AO 'Rossiiskaia samoletostroitelnaia korporatsiia MiG'; 'Nizhnii Novogorod aviatstroitelnyi zavod "Sokol"')

MiG-29K/KUB, Naval aviation (AO 'Obedinennaia aviatsionnaia korporatsiia' (OAK) – AO 'Rossiiskaia samoletostroitelnaia korporatsiia MiG')

Long-range interceptor PAK DP (Perspektivnyi aviataionnyi kompleks dalnego perekhvata)

At first (in 2014) said that work on a replacement of the MiG-31 would begin after 2017 and first plane to forces after 2025, but according to commander-in-chief air force Bondarev development will now begin from 2019.[116]

Strategic bomber PAK DA (Perspektivnyi aviatsionnyi kompleks dalnei aviatsii) (AO 'Obedinennaia aviatsionnaia korporatsiya' (OAK) – AO 'Tupolev')

Development project of GPV-2020, first flight 2019; serial production 2021–2022; to forces 2023.[117] The MOD concluded a contract for its development with Tupolev in 2009.[118]

[115] http://tass.ru/armiya-i-opk/2466125, 24 November 2015, 'Pervyi polet PAK FA s dvigatelem vtorogo etapa otlozhili do 2018 goda'.
[116] http://lenta.ru/articles/2015/08/13/pak/, 'Aviatsionnye kompleksy aviatsii'.
[117] http://www.armstrade.org/includes/periodics/news/2014/0811/102525144/detail.shtml, 11 August 2014, 'Glavkom VVS RD: PAK DA poidet v seriiu v 2021–2022 godakh'; Valagin, Anton (2014) 'Dal nuiu aviatsiiu osnastiat umnymi raketami', http://www.rg.ru/2014/08/10/raketa-site-anons.html, 10 August; http://ria.ru/defense_safety/20150525/1066304667.html, 25 May 2015, 'PAK DA poluchit printsipalno novoe oborudovanie'. 'Dal'nyi bombardirovshchik
[118] http://topwar.ru, 28 February 2011, 'Noveishii rossiikii bombardirovshchik oboidetsia bez pilotov'.

Strategic bomber Tu-160 (AO 'Obedinennaia aviatsionnaia korporatsiia' (OAK) - AO 'Tupolev'; 'Kazanskii aviatsionyi zavod')

During GPV-2020 there has been a modernisation programme, to be completed in 2019, for the 16 remaining Tu-160, but in May 2015 a decision taken to renew production at Kazan aviation works. At least 50 Tu-160M2 will be built. According to the commander-in-chief of the Air Force, this decision will not mean that work on the PAK DA will be halted.[119] According to Yu. Borisov, it is planned to build 4 Tu-160M2 a year from 2023, this will lead to a delay in the PAK DA programme.[120] As of August 2015 no contract had been signed and no funding allocated. Expert opinion suggests that renewing production last undertaken in 1984–1992 may be extremely difficult as inputs were then obtained from hundreds of organisations over the whole Soviet Union.[121] In August 2014 a contract was signed between the United Engine-building Corporation (ODK) and MOD for restoring the production of the NK-32 series 2 engine for modernised and new Tu-160s.[122]

- *Frontal bombers*

Su-34 (AO 'Obedinennaia aviatsionnaia korporatsiia' (OAK) – Kompaniia 'Sukhoi', 'Novosibirskii aviatsionnyi zavod')

Ground attack aircraft

Su-25UBM/Su-25TM (AO 'Obedinennaia aviatsionnaia korporatsiia' ('OAK') - Kompaniya 'Sukhoi', Ulan-Udenskii aviatsionnyi zavod)

Production was to have started in 2014 but the plane has still not completed flight tests. [123]

[119] http://www.armstrade.org/includes/periodics/news/2015/0528/105029384/detail.shtml, 28 May 2015, 'Minoborony Rossii zakupit ne menee 50 noykh strategicheskikh bombardovshchikov-raketonotsev Tu-160'; http://vpk.name/i135194.html, 2 July 2015, 'Borisov: Tu-160M2 budet v 2.5 raza prevoskhodit po effektivnosti predshestvennika' (original ITAR-TASS).

[120] http://www.armstrade.org/includes/periodics/news/2015/0717/150030214/detail.shtml, 17 July 2015, 'Minoborony RF s 2023 goda planiruet ezhegodno poluchat po tri bombardirovshchika Tu-160M2' (original RIA Novosti).

[121] Falichev, Oleg (2015) 'Tu-160M2: propastili vzlet', http://www.vpk-news.ru/articles/26398, 5 August.

[122] http://vpk.name/i133912.html, 16 June 2015, 'ODK: problem s dvigateliami dlia novykh bombardirovshchikov Tu-160M ne budet'.

[123] http://www.arms-expo.ru/news/archive/seriynye-su-25ubm-poyavyatsya-v-2014-godu01-01-2012-10-39-00/, 1 January 2012; http://vpk-news.ru/news/25637, 11 June 2015, 'VVS RF poluchat na vooruzhenie modernizirovvanye Su-25UBM'.

- *Trainers*

Yak-130 trainer (AO 'Obedinennaia aviatsionnaia korporatsiya' (OAK) – 'Korporatsiia Irkut', 'Irkutskii aviatsionnyi zavod' and 'Nizhnii Novogorod aviatstroitelnyi zavod "Sokol"')

U.[124] There was concern that the production of the Yak-130 could be disrupted by the ending of supply of engine components from Ukraine. The AI-222-25 engine, originally designed and built in Ukraine, is manufactured in Russia by the Moscow 'Saliut' corporation, initially on a 50/50 basis with 'Motor Sich'. It was reported that by 2014 Russian enterprises were still able to produce less than half the needed inputs.[125] However, it has since been reported that all components are now produced domestically.[126]

Yak-152 light trainer (AO 'Obedinennaia aviatsionnaia korporatsiia' (OAK) – 'Korporatsiia Irkut', 'Irkutskii aviatsionnyi zavod')

Under development, not yet in production. First flight scheduled in 2016, production 2017–2018?[127]

U/S. There is no Russian-built engine available for the Yak-152 and there is concern that production could be delayed while a solution is found as it may be impossible to import and Ukrainian or Western alternative.[128]

- *Transport, passenger and special aircraft*

An-70 transport (Kiev ANTK 'Antonov')

GPV-2020: originally 60 then reduced progressively to 0.[129]

U. Problems and delays reduced Russian interest in buying the An-70 but the break military supply relations with Ukraine made its purchase impossible.

An-124-200 transport (AO 'Obedinennaia aviatsionnaia korporatsiia' (OAK) – Ulianovsk AO 'Aviastar – SP')

[124] **U**. denotes Ukraine, .i.e. a comment relating to the impact of the breakdown of supplies from Ukraine on specific weapon systems.
[125] Pechorina, N. (2014) 'Russian-Ukrainian defense industry cooperation in 1992–2013', *Moscow Defense Brief*, No. 3.
[126] http://vpk.name/news/130489_dvigateli_dlya_yak130_nachali_proizvodit_bez_ukrainskih_detalei.html, 20 April 2015 (original, lenta.ru).
[127] http://www.armstrade.org/includes/periodics/news/2015/0831/103530875/detail.shtml, 31 August 2015, 'Uchebno-trenirovochnyi samolet Yak-152 sovershit pervyi polet v 2016 godu'.
[128] http://vpk.name/i130354.html, 17 April 2015, '"Irkut": samolety Yak-152 nachnut proizvodit v 2017 godu?'
[129] *Voenno-promyshlennyi kurer*, 11 April 2013, 'Ukraina vozmushchena otnsosheniem Rossii k samoletu An-70'.

Originally intended to procure an upgraded version of the An-124 from Ukraine, but the plan later abandoned, some existing An-124-100 being modernised instead and new Il-76-MD-90A built. The An-124-200 not yet in production in Ukraine.

An-140-100 transport-passenger aircraft (AO 'Obedinennaia aviatsionnaia korporatsiya' (OAK) – Samara aviatsionnyi zavod 'Aviakor' (Kiev ANTK 'Antonov'))

U. The programme of producing the An-140 halted 'temporarily' end July 2015 because of the lack of components from Ukraine and a decision that import substitution was not a viable option.[130]

An-148-100E passenger aircraft (AO 'Obedinennaia aviatsionnaia korporatsiia' (OAK) – 'Voronezh aktsionernoe samoletostroitelnoe obshchestvo' (VASO))

U. Some key components for building the An-148 are supplied by Ukraine. While there had been fears of a breakdown of deliveries to May 2015 they had not been halted.[131] However, by mid-July basic chassis elements had not been supplied by 'Yuzhmash' of Ukraine and alternative production is being organised in Russia at 'Gidromash'. The building of two aircraft has been postponed to 2016, when the GOZ will be 5.[132]

Il-476/76MD-90A heavy transport aircraft (AO 'Obedinennaia aviatsionnaia korporatsiya' (OAK) – Ulianovsk AO 'Aviastar – SP')

Il-112V light transport (AO 'Obedinennaia aviatsionnaia korporatsiia' (OAK) – AO 'Aviatsionnyi kompleks im. S.V. Iliushina'; 'Voronezh aktsionernoe samoletostroitelnoe obshchestvo' (VASO))

Not yet in production; first 2 by 2018.[133] Building started at VASO August 2015, first flight expected June 2017.[134] Order will be less than 62, serial production end 2018, beginning 2019.[135]

[130] http://top.rbc.ru/economics/31/07/2015/55bb7bef9a7947897f09656c, 31 July 2015, 'Rossiia priostanovit proizvodstvo samoletov An-140 iz-za Ukrainy'.
[131] http://vpk.name/i32863.html, 29 May 2015, 'Voronozheskii aviazavod oposaetsia sryva postavokk detalei s Ukrainy'.
[132] http://vpk-news.ru/news/26475, 7 August 2015, 'VASO perenosit postavku dvukh An-148 na 2016g'.
[133] http://www.armstrade.org/inclludes/periodics/news/2014/0912/102025618/detail.shtml, 12 September 2014, 'K 2018 Rossiia dolzhna poluchit dva pervykh eksempliara novogo legkogo VTS Il-112'.
[134] http://www.armstrade.org/includes/periodics/news/2015/0826/121530786/detail.shtml, 26 August 2015, 'Na VASO nachalos stroitelstvo pervogo obraztsa samoleta Il-112V'.
[135] http://vpk-news.ru/news/25221, 'Goszakaz na Il-112V budet umenshen'.

U. The decision to revive the dormant Il-112 (frozen by Serdiukov in 2010) project was taken when it was decided not to buy the Ukrainian An-140 as a main military transport. [136]

L-410UVP-E20 regional light transport passenger aircraft (Czech, 'Aircraft Industries' (formerly 'Let'), imported)

There are plans to build the L-410 in Russia, with the creation of an aviation 'cluster' in the Sverdlovsk oblast, basing assembly at the Urals zavod grazhdanskoi aviatsii.[137] The Czech producer, Aircraft Industries, is controlled by the Russian company AO 'Uralskaia gorno-metallurgicheskaia kompaniia'.[138]

Tu-214ON ('otkrytoe nebo') observation aircraft (AO 'Obedinennaia aviatsionnaia korporatsiya' ('OAK') – AO 'Tupolev'; 'Kazanskii aviatsionnyi zavod im. S.P. Gorbunova')

Tu-154M passenger aircraft (AO 'Obedinennaia aviatsionnaia korporatsiya' ('OAK') – Samara aviatsionnyi zavod 'Aviakor')

Il-62M passenger aircraft (AO 'Obedinennaia aviatsionnaia korporatsiya' ('OAK') – 'Kazanskii aviatsionnyi zavod im. S.P. Gorbunova')

Be-200 multirole amphibious aircraft (AO 'Obedinennaia aviatsionnaia korporatsiia' ('OAK') – AO 'Taganrogskii aviatsionnyi nauchno-tekhnicheskii kompleks im G.M. Berieva')

Il-78M-90A refuelling aircraft (AO 'Obedinennaia aviatsionnaia korporatsiia' ('OAK') – Ulianovsk AO 'Aviastar – SP')

Under development, based on Il-76MD-90A, prototype being built, with the goal of state testing in 2016.[139] It has been reported that the MOD intends to order more than 30.[140]

Military transport aircraft PAK TA, Il-106 (Perspektivnyi aviatsionnyi kompleks transportnoi aviatsii) ('Aviatsionnyi kompleks im. S.V. Iliushina')

[136] http://www.armstrade.org/inclludes/periodics/news/2014/0912/102025618/detail.shtml, 12 September 2014, 'K 2018 Rossiia dolzhna poluchit dva pervykh eksempliara novogo legkogo VTS Il-112 – "Izvestiia"')
[137] http://minpromtorg.gov.ru/press-centre/all/#!na_srednem_urale_poyavitsya_aviastroitelnyy_klaster, 5 August 2015.
[138] http://bmpd.livejournal.com/?skip=15, 1 August 2015, 'Pervyi polet L-410NG'.
[139] http://bmpd.livejournal.com/1417483.html, 5 August 2015, 'Novosti proizvodstva Il-76MD-90A'.
[140] http://www.ng.ru/armies/2015-07-13/1_strategy.html, 13 July 2015, 'Rossiia vtoroe uvelichit gruppirovku "strategov"'.

Development project, started in 2013, serial production expected at Ulianovsk after 2024. Will be known as Il-106.[141]

- ***Sources for planned GOZ and implementation***

- *Fixed wing aircraft – all*

GPV-2020 total: 600, Tikhonov, Aleksandr (2011) 'Slagaemye nesokrushimosti'; http://old.redstar.ru/2011/02/25_02/1_01.html, 25 February; 850, Pinchuk, Aleksandr (2013) 'Za budushchee trevogi net' (citing V. Bondarev, c-in-c air force), http://www.redstar.ru/index,php/ newspaper/item/10957-zabudushchee-trevogi-net, 19 August.

2010A: http://armstass.su/?page=article&aid=93156&cid=25, 24 February 2011.

2011P: http://www.kremlin.ru/news/10677, 19 March 2011 (Serdiukov).

2012A; 2013P: Pogosyan, M. (2013) 'Portfel imeiushchikhsia zakaazov obespechit stabilnoe razvitie OAK', http://vpk.news/i196124.html, 3 September.

2013A: http://www.militaryparitet.com/ttp/data/ic_ttp/6298/, 11 December 2013.

2014P: http://www.kremlin.ru/news/19716, 28 November 2013, 'Vladimir Putin provel soveshchanie po razvitiia Voenno-vodzuhnykh sil Rossii'.

Note, http://kremlin.ru/news/47256, 'Soveshchanie, posviashchennoe priemke voennoi produktsii', 19 December 2014 gives 142, but this figure, given by Putin, seems implausibly large and may include UAVs?

2014A: http://bmpd.livejournal.com/1473336.html, 15 September 2015, 'Itogi deyatelnosti Obedinennoi aviastroitelnoi korporatsii v 2014 godu i perspektivy'.

2015P:
http://function.mil.ru/news_page/country/more.htm?id=12005581@egNews

13 January 2015 (Shoigu). The annual report of OAK for 2014 gives a total of 124 delivered planes under both the state defence order and export contracts, suggesting 110–115 for the former, *Godovi otchet publichnogo aktsionernogo obshchestva 'Obedinennaia aviatsionnaia korporatsiia' za 2014 god*, p. 5.

- *Combat aircraft*

2010A, 2011A, 2012A, 2013A:
http://www.nationaldefense.ru/includes/periodics/defense/2014/0728/154713615, 15 September 2014, 'OAK: rezhimvzletnyi'.

2011P: Dmitrii Litovkin, Dmitrii (2010) 'Trillion rublei na reform armii', *Izvestiia*, 9 December.

[141] http://lenta.ru/articles/2015/08/13/pak/, 'Aviatsionnye kompleksy aviatsii'; http://vpk-name/i139197.html, 26 August 2015.

PAK FA (T-50) 5th generation fighter (Perspektivnyi aviatsionnyi kompleks frontovoi aviatsii)

GPV-2020 total: Safronov, Ivan (2015) 'Piatoe s minusom pokolenie', *Kommersant Daily*, 24 March p. 2 (2016–2018 8 per year, 2019–2020 14; according to this source, the MOD now plans an initial batch of 12 and then will determine the final number, possibly less than 52). Serial production from 2017, http://www.vpk.news.ru/news/25422, 28 May 2015, 'Seriinye postavki PAK FA nachnutsia v 2017 godu'. According to Yu. Borisov, 'in coming years' only 12 will be built, but orders for cheaper Su-35 fighters will increase, http://vpk.name/i135243.html, 3 July 2015, 'Minoborony sokrashchaet zakupku istrebitelei piatogo pokoleniia T-50' (original RIA Novosti).

Prototypes: RIA Novosti reports.

2015P: 4, as GPV-2020 total; 3, http://tass.ru/armiya-i-opk/2381491, 28 October 2015, 'OAK: ispytaniia istrebitelia 5-ogo pokoleniia idut po grafiku, podkliucheny eshche tri obraztsa'.

Su-35S

GPV-2020: 96, first contract for 48 in 2009 (66 billion roubles), second, 48 (up to 100 billion roubles), in August 2015, Nikolskii, Aleksei, 'Minoborony podpishet soglashenie o zakupke 48 istrebitelei Su-35 na aviasalon MAKS-2015'. *Vedomosti*, 11 August.

2011A, 2012A: Frolov (2014).

2011P: Barabanov, Mikhail (2011) 'VVS Rossii poluchaiut popolnenie', http://nvo.ng.ru/armament/2011-03-18/7_vvs.html

2013P, A: Zolotarev, Viacheslav (2015) 'Postavki voennykh samoletov Ministerstvu oborony Rossii v 2014 godu', http://vpk.name/1124498.html, 9 April (original, bmpd.livejournal.com). According to the well-informed source, the 12 planned for 2013 were delivered in February 2015. Frolov (2014) gives delivery in 2013.

2014P, A: as 2013 P, A.

2015P: 14, http;//vpk.name/i128848.html, 24 March 2015, 'Kholding "Sukhoi" v 2015 godu sdast voennym 23 novykh istrebitelia'.

Su-30MK2

2010A, 2013A: Frolov (2014), p. 40.

2014A: Zolotarev, Vyacheslav (2015).

2015P: http://vpk.name/i128848.html, 24 March 2015, 'Kholding "Sukhoi" v 2015 godu sdast voennym 23 novykh istrebitelia'.

Su-30SM

GPV-2020 total: http://www.militaryparitet.com/ttp/data/ic_ttp/6794, 19 September 2014 (60 for air force; 12 for navy).

2011P. A: http://www.function.mil.ru/for_media/press_conferences, 24 January 2012 (A. Sukhorukov).

2012A, 2013A: Frolov (2014), p. 40.

2014P: http://vpk.news/i116587.html, 1 September 2014, 'Irkutskii aviazavod otpravilv voiska ocherernuiu partiiu samoletov Su-30SM i Yak-130'.

2014A: Zolotarev, Viacheslav (2015) 18 to air force, 3 to naval aviation.

2015P: 30, http://vpk.name/i119274.html, 14 October 2014, 'Demchenko: "Irkut" postroit MS-21 s uchetom sozdaniia voennoi aviatekhniki'.

Su-27SM3

GPV-2020 total: Barabanov, Mikhail (2011). Total to contract of 2010 but believed to be all under GPV-2020.

2010A, 2011A, 2013A: Frolov (2014).

2011P: Barabanov, Mikhail (2011).

MiG-35S

GPV-2020 total: 37, Frolov, Andrei (2013a) 'GPV-2020 slaba v oblasti aviatsionnykh vooruzhenii'; http://vpk-news.ru/articles/1736130, 11 September; 30,
http://www.armstrade.org/includes/periodics/news/2015/0812/122530562/detail.shtml, 12 August 2015, 'Minoborony zakliuchit pervyi kontrakt na zakupku istrebitelei MiG-35S dlia VVS RF ne ranee 2018 goda'.

Originally to be built from 2013, but contract then delayed until 2016, http://vpk.name/i195588.html, 26 August 2013, 'Minpromtorg: Minoborony ne otkazyvalos ot zakupki MiG-35'. In August 2015 reported that contract for 30 delayed until 2018, source as above.

MiG-29SMT

GPV-2020, total; contract with air force: http://vpk.name/i118619.html, 2 October 2014, 'MiG-35 vnesli v plan gosoboronzakaz')

2010A: Frolov (2014) (last of 28 MiG-29SMT and 6 MiG-29UBT originally to have been supplied to Algeria).

MiG-29K/KUB

GPV-2020 total: Frolov, Andrei (2013a).

2013A: Frolov (2014), p. 40.

2014P, 2015P: http://vpk.name/i116999.html, 8 September 2014, ‘Morskaia aviatsiia VMF RF do kontsa goda poluchit desyat samoletov MiG-29K’.

- *Frontal bombers*

Su-34

GPV-2020 total: 140, Frolov, Andrei (2013a).

2010A, 2012A, 2013A: Frolov (2014).

2011P: Barabanov, Mikhail (2011).

2011A: http:// www.function.mil.ru/for_media/press_conferences, 24 January 2012 (A. Sukhorukov).

2012P: http://www.redstar.ru, 10 February 2012, ‘Seichas ne 1990-e’.

2014P: http://vpk.name/i115897.html, 20 August 2014, ‘Su-34: popolenie v boevaia ucheba’.

MiG-29K

2014A: Zolotarev, Viacheslav (2015) (2 above plan).

- *Ground attack aircraft*

Su-25UBM/Su-25TM

GPV-2020 total: 10–20, http://army-news.ru/2010/09/sozdanie-komandovanij/, 27 September 2010; 16, http://russia-defence.ru/2014/11/aviaciya-v-gpv-2020/, 25 November 2014, ‘Aviatsiia v GPV-2020’.

- *Trainers*

Yak-130 trainer

GPV-2020 total: 80, Frolov, Andrei (2013a).

2010A, 2011A, 2012A, 2013A: Frolov (2014).

2011P: Barabanov, Mikhail (2011).

2015P:

30, Demchenko, Oleg (2014), ‘“Irkut” postroit MS-21 s uchetom sozdaniia voennoi aviatekhniki’, http://vpk.name/i119274.html, 14 October; 12, http://vpk.name/i129819.html, 9 April 2015, ‘Rost vopreki slozhnostiam’ (citing Yu. Borisov). Suggests that GOZ for 2015 was reduced. 12 confirmed, first 4 delivered, http://bmpd.livejournal.com/1511336.html, 8 October 2015, ‘Pervye Yak-130 dlia VKS Rossii po programme 2015 goda’ (with the 4, total serial output for MO 71 units).

Yak-152 light trainer

GPV-2020 total: http://www.vz.news/2015/3/24/736052.html, 24 March 2015, 'VVS Rossii reshili priobresti 150 uchebnykh samoletov Yak-152 do 2020goda'; http://vpk.name/i125418.html, 'Uchebno-trenirovochnyi Yak-152 vpervye podnimetsia v nebo oseniu'.

- *Transport, passenger and special aircraft*

An-124-200 transport

GPV-2020 total: up to 10, http://www.armstrade.org/includes/periodics/news/2012/0120/132011231/detail.shtml, 20 January 2012.

An-140-100 transport-passenger aircraft

GPV-2020, total: 10, Frolov, Andrei (2013a).

2011A, 2012A: Frolov (2014).

2012P: Note, 6, http://www.lenta.ru/news/2012/01/19/an140/, 20 January 2012.

2014P: http://vpk.name/i116999.html, 8 September 2014, 'Morskaia aviatsiia VMF RF do kontsa goda poluchit desyat samoletov MiG-29K'. (One for naval aviation)

2014A: Zolotarev, Viacheslav (2015).

An-148-100E passenger aircraft

GPV-2020 total: 20, Folov, Andrei (2013a); 15, http://vpk-news.ru/news/26475, 7 August 2015, 'VASO perenosit postavku dvukh An-148 na 2016g'.

2013A: Frolov (2014).

2014A: Zolotarev, Viacheslav (2105).

2015P: 4, fulfilment 2, http://vpk-news.ru/news/26475,7 August 2015, 'VASO perenosit postavku dvukh An-148 na 2016g'.

Il-476/76MD-90A heavy transport aircraft

GPV-2020:39, http://www.rg.ru/2013/04/25/pogosyan.html, 25 April 2013, 'Samolety – prosto "super"' (interview with Mikhail Pogosian); 60, http://vpk-news.ru/articles/17361, Frolov, Andrei (2013a).

2014A, 2015P: http://vpk.name/i144552.html, 19 November 2015, 'Chetveryi seriinyi Il-76MD-90A nakonets-to postroen v Ulianovske'.

Il-112V light transport

GPV-2020, total: up to 100, Frolov, Andrei (2013a); 62, Nikolskii, Aleksei and Sobol, Yekatrina, (2013) 'Il-112 snova v stroiu', *Vedomosti*, 12 August.

L-410UVP-E20 regional light transport passenger aircraft

GPV-2020 total: Frolov, Andrei (2013a).

2011A, 2012A, 2013A, 2015A: http://bmpd.livejournal.com/1424032.html, 'Novye samolety L-410UVP-E-20v CCS Rossii' (which suggested that sanctions were avoided in 2015 as the client was the official dealer of Aircraft Industries, 'Uktus-Avia' company of Yekaterinburg, not the MOD directly).

Tu-214ON ('otkrytoe nebo') observation aircraft

2011P: Barabanov, Mikhail (2011).

2013A: Frolov (2014).

2014A: Zolotarev, Viacheslav (2015).

Tu-154M passenger aircraft

2010A, 2012A, 2013A: Frolov (2014).

2011P: Barabanov, Mikhail (2011).

2012P: http://www.lenta.ru/news/2012/01/19/an140/, 20 January 2012.

Il-62M passenger aircraft

2010A: Barabanov, Mikhail (2011).

Be-200 multirole amphibious aircraft

GPV-2020 total; to end 2016: http://vpk.name/i116999.html, 8 September 2014, 'Morskaia aviatsiia VMF RF do kontsa goda poluchit desyat samoletov MiG-29K' (for naval aviation).

2014P: as GPV-2020. But in July 2015 revised to 6 by 2020, http:/www.armstrade.org/includes/periodics/news/2015/0717/151030216/detail.shtml, 17 July 2015, 'Komandovanie VMF namereno do 2020 goda zakazat partiiu gidrosamoletov tipa Be-200'.

Helicopters, UAVs and cruise missiles

Table 19
Helicopters, UAVs and cruise missiles

	2010 GOZ	2011 GOZ	2012 GOZ	2013 GOZ	2014 GOZ	2015 GOZ	GPV-, 2020 Total
Helicopters	30/37,57	109/82	120/118	120/100+	130/135	88/ **U**	1000, 1150
Attack							
Ka-52	/4	10/12	/21	/17	}	16/	180;146
Mi-28N/NM	/12	15/10	/14	/14	} /46		167
Ka-52K (ship use)					}	10/	32,16
Transport and other					/72		
Mi-28UB							40-60
Mi-35M		2/4	/16	/11			49
Mi-8AMTSh/AMTSh	/10 }34	60+/c5	/c.70	/53			} c.500
Mi-8MTB/8MTB-5-1	/4 }	0		/12			}
Mi-26M transport		} /	/7				38
Ka-31R		1/4	/1				
Ka-226			/9	/9			36
Ka-60 Kasatka		6/6					c.100
transport	/2		/6	/6			70, 40

'Ansat'-U light trainer Eurocopter AS350B3E Eurocopter AS355NR AW-139 transport		6/5	/3 /3				35, 0
UAVs 'Forpost' (Searcher Mk II) 'Orlan-10' 'Eleron-10' 'Lastochka' 'Nadvodchik' 'Zastava' (Bird Eye 400) Heavy (strike) UAV			/1 /10 /20 /20 /20	/10+ /27	/179	10/	4,000+ 25? 2017-8
Cruise missiles X-555 long-range	/34	20/	20/				

Notes: .../... planned number in GOZ for year/actual number procured by armed forces. **U** denotes Ukraine, .i.e. a comment relating to the impact of the breakdown of supplies from Ukraine on specific weapon systems.

c. aproximate

- ***Systems and notes***

- *All helicopters*

S. Russian-build helicopters, Kamov and Mil, have traditionally been supplied with engines developed by the 'Progress' design bureau and built by the 'Motor Sich' company, both of Zaporizhia/Zaporozhe. Ukraine. In recent years, since the 'Orange revolution' Russia has been developing its own manufacture at the 'Klimov' works, St. Petersburg. However, the volume of output is still not adequate to replace all imports from Ukraine, although needs for building combat helicopters can now be met. This shortfall explains the drop in the number of helicopters in the defence order for 2015, 88 compared with over 130 in 2014. According to Sergei Chemezov, general director 'Rostekh', the St. Petersburg factory will produce 50 engines in 2015, 150 in 2016 and at least 350 in 2017, *Vedomosti*, 1 June 2015, 'My poluchili vozmozhnost sozdat vse svoe!', Aleksandra Terenteva, interview with Chemezov. Ukraine intensified the sanctions against Russia by a Presidential order of 16 September 2015. This listed some of 'Motor Sich''s main customers, including 'Vertolety Rossii' and its main enterprises, imposing a total ban on all deliveries to them. Repair works of the MOD were not listed and it is possible that deliveries will continue for modernisation and repair work. Before the new restrictions were imposed, 250 VK-2500 and TV3-117 engines had already been delivered to Russian customers in 2015. This new measures could lead to a reduced volume of helicopter production in Russian in 2016, http://vpk.name/i140955.html, 23 September 2015, 'Sanktsii AP: Poroshenko podpisal smertnyi prigovor "Motor Sich"'.

Attack helicopters

Ka-52 'Alligator' (Kholding 'Vertolety Rossii' – 'Kamov'; 'Arsenevskaia aviatsionnaia kompaniia "Progress" im. N.I. Sazykina')

Mi-28N (Kholding 'Vertolety Rossii' – Moskovskii vertoletnyi zavod im. M. L. Milia'; Rostov-na-Done AO 'Rosvertol')

Ka-52K - for ship use (on 'Mistral') (Kholding 'Vertolety Rossii' – 'Kamov'; Arsenevskaia aviatsionnaia kompaniia "Progress" im. N.I. Sazykina')

Note, as of May 2015 no MOD order had been placed, but 4 have been built and handed over for testing.[142]

[142] http://www.arms-expo.ru/news/novye_razrabotki/zakazov_na_ka_52k_vertolety_rossii_poka_ne_poluchali/, 13 May 2015; http://vpk.name/i132348.html, 22 May 2015, 'Chetyre korabelnykh Ka-52K peredany dlia ispytanii'.

- *Transport and other*

Mi-28UB (Kholding 'Vertolety Rossii' – Moskovskii vertoletnyi zavod im. M. L. Milia; Rostov-na-Done AO 'Rosvertol')

Mi-35M (Kholding 'Vertolety Rossii' – Moskovskii vertoletnyi zavod im. M. L. Milia; Rostov-na-Done AO 'Rosvertol')

Mi-8AMTSh/AMTSh (Kholding ''Vertolety Rossii' – Moskovskii vertoletnyi zavod im. M. L. Milia; Kazanskii vertoletnyi zavod and Ulan-Udesnkii aviatsionnyi zavod)

Mi-8MTB/8MTB-5-1 (Kholding 'Vertolety Rossii' – Moskovskii vertoletnyi zavod im. M. L. Milia; Kazanskii vertoletnyi zavod and Ulan-Udesnkii aviatsionnyi zavod)

Mi-26M heavy transport (Kholding 'Vertolety Rossii' – Moskovskii vertoletnyi zavod im. M. L. Milia; Rostov-na-Done AO 'Rosvertol')

Ka-31R (Kholding 'Vertolety Rossii' – 'Kamov'; Kumertauskoe aviatsionnoe proizvodstvennoe predpriiatie)

Ka-226 (Kholding 'Vertolety Rossii' – 'Kamov'; Kumertauskoe aviatsionnoe proizvodstvennoe predpriiatie)

S? Has foreign supplied engines, not known if affected by sanctions.[143]

Ka-60 'Kasatka' transport (Kholding 'Vertolety Rossii' – 'Kamov')

'Ansat'-U light trainer (Kholding 'Vertolety Rossii' – Kazanskii vertoletnyi zavod)

S? The 'Ansat' has Pratt & Whitney engines, but as a trainer may not be affected by sanctions.

A new Russian engine (VK-800V) is under development but may not be ready for use in the 'Ansat' for 3 to 4 years.[144]

Eurocopter AS350B3E and Eurocopter AS355NR (imported)

Augusta Westland AW139 transport (Italy)

MOD planned to purchase 35. An assembly plant established in Russia, built 2 AW139s by August 2013. Plan then cancelled.[145]

[143] http://ria.ru/maks/20150825/1205897982.html, 25 August 2015, 'Mikheev: problemy importozameshchniia pri sozdanii voennykh vertoletov net'.
[144] http://vpk.name/i144402.html, 17 November 2015, 'ODK: dvigatel VK-800V stanet bazovym dlia legkikh vertoletov Rossii'.
[145] http://www.themoscowtimes.com, 22 August 2013, 'Runup to MAKS Air show littered with broken deals'.

- *UAVs (unmanned aerial vehicles)*

According to Shoigu almost 320 billion roubles will be spent on the UAV programme to 2020, Gundarov, Vladimir (2015) 'Bespilotniki budut pechatat na 3D-printere, http://nvo.ng.ru/nvoevents/2015-9-11/2_3d.html, 11 September. In 2011 the armed forces had only 180 UAVs, by the end of 2015 1 720, http://function.mil.ru/files/morf/2015-12-11_MoD_board_extended_session_RUS.pdf, 11 December 2015, 'Tezisy doklada Ministra oborony Rossiiskoi Federatsii na rashshirennom zasedanii Kollegii Minoborony Rossii'.

'Forpost' and 'Zastava' (imported; assembled Yekaterinburg AO 'Uralskii zavod grazhdanskoi aviatsii')

Israeli Aerospace Industries 'Searcher Mk II' assembled under licence in Yekaterinburg. Contract for 10 sets, each with 3 UAVs (9.0 billion roubles). The same contract also provided for the supply of 27 'Bird Eye 400', known in Russia as 'Zastava' (1.4 bn.r.). [146] In April 2009 Russia imported 12 'BirdEye-400s', later concluded contracts for 50 more.[147] In 2015 MOD purchased 10 more sets of 'Forpost' for assembly in Yekaterinburg.[148]

'Altius-M' heavy strike UAV (Kazan OKB 'Sokol' and St Petersburg 'Tranzas' (renamed 'Kronshtadt' in 2015)

Under development, planned procurement from 2017–2018: http://vpk.name/i117613.html, 17 September 2014, 'Zampred Voenno-promyshlennoi kommissii: tyazhelye bespilotniki RF poidut v seriiu v 2017–18 gg'. Kazan OKB 'Sokol' and St. Petersburg 'Tranzas' company, to contract with MOD of 2012, *Novyi oboronnyi zakaz. Strategii*, February 2013, pp. 24–25, Stanislav Kovalskii. 'Rossiiskie BPLA: sostoitsIa li proryv?' Flight weight 5 tonnes; first test flight expected 2015, http://nvo.ng.ru/concepts/2015-05-22/2_red.html, 22 May 2015, 'V dvukh shagakh ot voennogo pariteta'.

'Orlan-10', light reconnaissance UVA, petrol engine (St. Petersburg 'Spetsialnyi tekhnologicheskii tsentr')[149]

[146] http://bmpd.livejournal.com/, 21 May 2015, 'Na Ukraine sbit BLA "Forpost" sborki UZGA'; Nikolskii, Aleksei and Khimshiashvili, Polina (2013) 'Rusifikatsiia "Forposta"', 18 October, http://www.vedomosti.ru/ newspaper/articles/2013/10/18/rusifikaciya-forposta.

[147] http://www.rbcdaily.ru/2011/07/20/industry/562949980684560/, 20 July 2011, 'Rossiiskaia armiia vozmet na vooruzhenie otechestvennye bespilotniki'.

[148] Nikolskii, Aleksei (2015) 'Rossiiskaia armiia prodolzhit zakupat bespilotniki izrailskoi razrabotki', *Vedomosti*, 4 September.

[149] http://bastion-opk.ru/orlan-10/, accessed 22 May 2015.

In 2014 supplied c.200 under to forces; in 2015 to supply almost 300.[150] In 2015 testing undertaken of 'Orlan-30', a heavier duty version. [151]

'Eleron-3 SV' light reconnaissance UVA (Kazan 'Eniks' company)[152]

'Grusha' light reconnaissance UVA ('Izhmash – Bespilotnye sistemy')[153]

'Lastochka' light reconnaissance UVA (Izhevsk company 'ZALA-Aero Group' – part of concern 'Kalashnikov')[154]

'Takhion' light reconnaissance UVA, electrical with fuel elements ('Izhmash – Bespilotnye sistemy')[155]

'Chirok' light reconnaissance/strike UAV ('Obedinennaia priborostroitelnaia korporatsiia' ('Rostekh'))

A new development, air-cushion based.[156] Developed by Moscow NI radiotekhnicheskii institut; c.700 kg, range up to 2 500 km. Flight tests to be completed by summer 2016.[157]

'Fregat' heavy, high-speed, UAV (St. Petersburg company 'Kronstadt' (formerly 'Tranzas')

New development project for serial production in 2022.[158]

'ZALA 421-16E5' long-range reconnaissance UAV ('Zala Aero group' of Concern 'Kalashnikov')

Is also a new development.[159]

'Avius-1' heavy reconnaissance/strike UAV (AO 'RTI')

[150] http://vpk.name/i137462.html, 3 August 2015, '"Orlanov" obnaruzhivaiut chashche, chem proizvodiat'.
[151] http://vpk.name/i142056.html, 12 October 2015, 'Bespilotnik s povyshennoi gruzopodemnostiu "Orlan-30" proshel gosispytaniia'.
[152] http://www.airwar.ru/forum/viewtopic.php?p=5580, 22 June 2009.
[153] http://bastion-opk.ru/grusha/, accessed 21 May 2015.
[154] http://army-news.ru/2011/01/ne-opozdaet-li-rossiya-s-bespilotnikami/, 9 January 2011; http://www.vz.ru/news/2015/8/27/763574.html, 27 August 2015).
[155]http://vpk.name/news/108171_otechestvennyie_bla_s_toplivnyimi_elementami_budut_prodemonstrirovanyi_v_iyune.html, 8 April 2015 (original, aviaport.ru).
[156] http://lenta.ru/news/2015/08/17, chirok, 17 August 2015.
[157] http://www.armstrade.org/includes.periodics//news/2015/0825/100530731/detail.shtml, 25 August 2015, 'Letnye ispytaniia BLA "Chirok" zavershatsia k letu 2016 goda'.
[158] http://www.vz.ru/news/2015/8/27/763574.html, 'Razrabotchik: Perspektivnyi BPLA "Fregat" smozhet razvivat skorost do 700 km/ch', 27 August 2015.
[159] http://www.vz.ru/news/2015/8/27/763574.html, 'Razrabotchik: Perspektivnyi BPLA "Fregat" smozhet razvivat skorost do 700 km/ch', 27 August 2015.

Under development, based on civilian 'Kaira' UVA. Weight of military version, either reconnaissance or strike, to be up to 2 tonnes; up to 35 hours flying time. First flight of 'Kaira' 2017.[160]

'Korsar' reconnaissance UAV (KB 'Luch' of 'Obedinennaia priborostroitelnaia korporatsiia' ('Rostekh'))

A new medium 200 kg short-range UAV for the MOD. To be produced at a new production facility being built in Rybinsk, equipped with 3D printer. To be in serial production in 2017, at first 20–25 a year, rising to 100.[161]

'Zenitsa' medium-range strike UAV (OKB Simonova (formerly KB 'Sokol'))

Development project. Medium range with speed of 800 k.p.h.[162]

'Okhotnik-U' long-range strike UAV (Kholding 'Sukhoi')

Development project. To be created by 2020. 20 tonnes weight.[163]

'Granat-5' light vertical take-off and landing reconnaissance UAV for naval special forces ('Izhmash – Bespilotnye sistemy')

Under development, delivery to forces planned for mid-2016.[164]

S/U. It is possible that the development of new UAVs will be affected by the breakdown of supply relations with Ukraine and/or Western sanctions. It is known that the 'Motor Sich' company of Ukraine supplies engines for UAVs (MS-400) and it likely that some Western components and materials have been used. However, Rybinsk NPO 'Saturn' is now producing them on a growing scale, with a claimed increase of output of its 36MT engine of 3.5 times in the last two years.[165] (See also cruise missiles, below).

[160] http://vpk.name/i140207.html, 11 September 2015, 'Novyi bespilotnik "Avius-1" vesom do dvukh tonn sozdaetsia v Rossii' (original RIA Novosti).
[161] Gundarov,Vladimir (2015) 'Bespilotniki budut pechatat na 3D-printere', http://nvo.ng.ru/nvoevents/2015-9-11/2_3d.html, 11 September.
[162] http://vpk.name/i141937.html, 9 October 2015, 'Istochnik: v Rossii sozdadut udarnyi BPLA razvivaiushchii skorost 800 km/ch'.
[163] Ibid.
[164] http://www.armstrade.org/includes/periodics/news/2015/1021/115031787/detail.shtml, 21 October 2015, 'Gosispytaniia bespilotnik-konvertoplana "Granat-5", razrabatannogo dlia VMF, nachnutsia do kontsa goda'.
[165] http://www.motorsich.com/rus/products/aircraft/tde/ms400/; http://www.militarynews.ru/story/.asp?rid=1&nid=386893, 'NPO "Saturn v razy uvelichil proizvodstvo dvigatelei dlia bespilotniki – upravliaiushchii direktor'.

- *Cruise missiles*

The number of cruise missiles increased 5 times, 2011–2013, and will increase 30 times by 2020.[166]

X-555 cruise missile (AO 'Korporatsiia takticheskoe raketnoe vooruzhenie' – Dubna AO 'Gosudarstvennoe mashinostroitelnoe KB "Raduga"')

Arms Tu-160 strategic bomber, 2 000 km range; conventional, but in a 'critical situation' a nuclear warhead can be installed.[167]

U Some Russian cruise missiles, in particular the X-59 family of air launched missiles, had Ukrainian 'Motor Sich' supplied R95 small gas turbine power units. NPO 'Saturn' has developed the 36MT engine to replace it.[168] (See also UVAs, above).

- ***Sources for planned GOZ and implementation***

- *All helicopters*

GPV-2020 total: 1 000, Tikhonov, Aleksandr (2011); 1 150, www.lenta.ru/news/2011/08/16/helos/, 16 August 2011.

2010P: http://kremlin.ru/news/11206, 10 May 2011 (Medvedev).

2010A: 37, http://armstass.su/?page=article&aid=93156&cid=25, 24 February 2011; 57, Barabanov, Mikhail (2011).

2011P: 109, http://www.kremlin.ru/news/10677, 19 March 2011 (Serdiukov).

2011A: 82, Sokirko, Viktor (2012) 'Odin uchebnyi pusk raket stoit 780 mln. rublei', *Komsomolskaia Pravda*, 27 January.

2012P: Kalinin, Ignat (2012) 'Voennye ne soglasny s Rogozym', *Moskovskii komsomolets*, 25 January.

2012A: http://vpk.name/i85389.html, 1 March 2013, 'Gosoboronzakaz v aviatsii: kakim emu byt?' (original, AviaSoiuz).

2013P, 2014P: Viatkin, Yaroslavl (2014) 'Armiia gotovitsia k bolshomu ryvku', *Argumenty nedelii*, 23 January, p. 7.

[166] http://www.rg.ru/2013/07/05/doktrina-site-anons.html, 'Prezident prizval sdelat armiiu bolee effektivnoi'.
[167] http://www.rg.ru/2015/05/29/raketonosci.html, 28 May 2015, '"Belyi lebed" letit, a ego vidno. Voznobnliaetsia proizvodstvo raketonotstsev Tu-160').
[168] http://vpk.name/i140135.html, 10 September 2015, 'Vladimit Gutenev: zavisimost rossiiskoi ekonomiki ot imports pust i vysoka, no daleko ne fatalna'.

2013A: http://www.kremlin.ru/news/19716, 28 November 2013, ‘Vladimir Putin provel soveshchanie po voprosam razvitiia Voenno-vozdushnykh sil Rossii’.

2014A: http://kremlin.ru/news/47256, Soveshchanie, posvyashchennoe priemke voennoi produktsii, 19 December 2014 (including 46, attack; 72 transport, air assault)

2015P:
http://function.mil.ru/news_page/country/more.htm?id=12005581@egNews

13 January 2015 (Shoigu).

Attack helicopters

Total

2014A: 46, http://kremlin.ru/news/47256, Soveshchanie, posvyashchennoe priemke voennoi produktsii, 19 December 2014.

Ka-52 'Alligator'

GPV-2020 total: 180, Frolov, Andrei (2013a); 146, http://vpk.name/i124603.html, 13 January 2015 (original, ITAR-TASS).

2010A, 2011A, 2012A, 2013A: Frolov (2014), p. 40.

2011P: Barabanov, Mikhail (2011).

Mi-28N

GPV-2020 total: Frolov, Andrei (2013a).

2010A, 2011A, 2012A,2013A: Frolov (2014).

2011P: http://www.kremlin.ru/news/10677, 19 March 2011 (Serdiukov).

It has been reported that by the beginning of 2015 90 Mi-28N had been delivered to the air force, including pre-serial production machines. Two have been lost in accidents, in 2011 and August 2015, http://bmpd.livejournal.com, 2 August 2015,'Padenie Mi-28N'.

Ka-52K - for ship use

GPV-2020 total: 32,
http://flot.com/news/navy/index.php?ELEMENT_ID=164372, 8 April 2014,
'Rossiya postavit na vooruzhenie 32 palubnykh vertoleta tipa Ka-52K'.

c. 16 to be built for navy even without 'Mistral',
http://www.armstrade.org/includes/periodics/news/2015/0525/120529316/detail.shtml,

25 May 2015, 'Sergei Mikheev: vertolet Ka-52K naidet primenenie v VMF dazhe bez "Mistralei"'.

2015P: http://lenta.ru/news/2015/01/12/ka52k/, 12 January 2015, 'Vertolety s "Mistralei" otpravyatsya na Kamchatku'.

- *Transport and other*

Mi-28UB

GPV-2020 total: http://www.armstrade.org/includes/periodics/news/2013/0812/100519714/detail.shtml, 12 August 2013, 'Minoborony do 2020 goda zakupit 40-60 vertoletov Mi-28UB -Viktor Bondarev'.

2010A, 2011A, 2012A, 2013A: Frolov (2014), p. 40

Mi-35M

GPV-2020 total: Frolov, Andrei (2013a).

2010A, 2011A, 2012A, 2013A: Frolov (2014).

2011P: Barabanov, Mikhail (2011).

Mi-8AMTSh/AMTSh

GPV-2020 total: Mi-8AMTSh and Mi-8MTB: Frolov, Andrei (2013a).

2010A, 2011A, 2012A, 2013A: Frolov (2014).

Note, 2010A, all Mi-8: 34, 57, Barabanov, Mikhail (2011).

2011P, all Mi-8: Barabanov, Mikhail (2011).

Mi-8MTB/8MTB-5-1

2010A, 2011A, 2012A, 2013A: Frolov (2014).

Mi-26M heavy transport

GPV-2020 total: Frolov, Andrei (2013a).

2010A, 2011A, 2012A, 2013A: Frolov (2014).

2011P: Barabanov, Mikhail (2011).

Ka-31R

2012A: Frolov (2014).

Ka-226

GPV-2020 total: Frolov, Andrei (2013a).

2011A, 2012A, 2013A: Frolov (2014).

2011P: Barabanov, Mikhail (2011).

Ka-60 'Kasatka' transport

GPV-2020 total: http://lenta.ru/news/2011/05/30/ka60/, 30 May 2011. Long under development; production expected from 2015.

'Ansat'-U light trainer

GPV-2020 total: Frolov, Andrei (2013a); 40 by end 2016, http://vpk-news.ru/news/26765, 27 August 2015, 'Postavka VVS RF 40 vertoletov "Ansat-U" zavershitsya v 2016 godu'.

2010A, 2011A, 2012A, 2013A: Frolov (2014). Note, Barabanov, Mikhail (2011) gives 2010A, 4; http:// www.function.mil.ru/for_media/press_conferences, 24 January 2012 (A. Sukhorukov), 2011A, 2 not delivered.

2015-16: by August 2015 36 had been delivered, with 1 more in 2015 and final 3 in 2016, http://vpk-news.ru/news/26765, 27 August 2015, 'Postavka VVS RF 40 vertoletov "Ansat-U" zavershitsya v 2016 godu'.

Eurocopter AS350B3E and Eurocopter AS355NR (imported)

2012A: Frolov (2014).

UAVs (unmanned aerial vehicles)

GPV-2020 total: http://vpk.name/i117427.html, 15 September 2014, 'Nachalnik rossiiskogo Genshtaba – ob osnovnykh zadachakh razvitiia armii'.

All, 2012A: Frolov (2014).

All, 2014A: Frolov (2015), p. 30.

'Forpost' and 'Zastava'

'Forpost', 2013A: http://vpk.name/i97906.html, 2 October 2013.

- *Cruise missiles*

X-555 cruise missile

2010A, 2011P: Litovkin, Dmitrii (2011) 'Armeiskie zadachi', *Izvestiya*, 24 March, p. 11.

A4 Ground forces equipment

Table 20. Ground forces equipment

	2010 GOZ	2011 GOZ	2012 GOZ	2013 GOZ	2014 GOZ	2015 GOZ	GPV-2020 Total
Tactical ballistic missile							
'Iskander'	l.u.5/6[a]	l.u./c.5[a]		2/2	2/2	2/2	10
Tanks							2,300+
T-90A	63/61	0/0	0/0				
T-14 'Armata'							2,300
Armoured vehicles					/c.280	701/	
Iveco LMV M65,'Rys''		/10	/57	301/207			
GAZ-2075 'Tigr-M'		/30+	10+/10+	/10+[a]			
'Taifun-U'					/30		
'Taifun-K'					/30	**S?**	
BTR-82/82A		83/c.150		/290			
BTR-80A			/150				
BMP-3	c.50/		/83	/112			
'Kurganets'							
'Bumerang'						**S?**	
'Volk' VPK-3927							
'Scorpion LShA-2B'							

Artillery - s-p and guns	151/78		36/				c.2,000
Msta-S' s-p howitzer	/36[a]		/40[a]	/40			574
'Kornet' anti-tank system	/18		/20				
Koalitsiya-SV SAU 2S35				/2	10/		
'Tornado-G' MRLS		/30[a]	/20[a]				
Automobiles	/c.6,500	/8,531	/2,000a	/5,200+	/5,000+	1,545 /2,292	30,000+
Infantry combat system							
'Ratnik'						50,000	
Arms for parachute troops							
BMD-4M 'Sadovnitsa'		10/3	10,7/	/2		62,50/	700
BTR-MD 'Rakushka'						22,30/	c.700
Ground forces air defence							
'S-300V4' (division)			/12units	/1	/2		27
'Verba' (brigades,divisions					/2b,2d	/2b,2d	

Notes: .../... planned number in GOZ for year/actual number procured by armed forces. b is brigade., d. is division.

- ***Systems and notes***

'Iskander-M' operational-tactical missile system (Kolomna KB mashinostroeniia/ Volgograd 'Titan' TsKB)

Procured in brigade sets (12 launch units); in a brigade, 3 divisions. Prior to 2013 individual divisions only. Each set has 51 units of equipment.[169]

- *Main battle tanks*

T-90A (AO 'Nauchno-proizvodstvennaia korporatsiia "Uralvagonzavod" im. F. E. Dzherzhinskogo – Nizhnii Tagil', 'Uralvagonzavod')

T-14 'Armata' main battle tank (AO 'Nauchno-proizvodstvennaia korporatsiia "Uralvagonzavod"' im. F. E. Dzherzhinskogo – Nizhnii Tagil', 'Uralvagonzavod')

Note, in early 2012 it was expected that prototypes would go to troops in 2013, with volume deliveries from 2015.[170] In 2014 a MOD order for a trial batch of 16.[171] In November 2015 was reported that a batch of 20 was being prepared for handover to the army for trial use.[172] According to the director of 'Uralvagonzavod' the GPV-2020 total of 2 300 may not be built until nearer 2025. Unit cost with volume production 250 million roubles.[173] Also under development is the T-13 infantry combat vehicle on 'Armata' platform.

Note: the ground forces have been receiving modernised T-72 tanks: c.40 T-72BA in 2010, 70 in 2011 and 30 in 2012. In 2013 260 modernised and repaired T-72B3s were supplied.[174]

According to Yu. Borisov, the MOD is planning to modernise c.400 T-90 tanks, apparently by 2020.[175]

- *Armoured vehicles*

Iveco LMV M65, 'Rys', built under licence (Voronezh 'MVPS' – joint enterprise 'Oboronservis' and Iveco)

[169] http://www.militarynews.ru/story.asp?rid=1&nid=383129, V armiiu postavlen piatyi komplekt "Iskander-M" – KB mashinostroeniia', 16 July 2015.
[170] http://vpk.name/i65311.html, 22 February 2012, 'Glavkom SV Aleksandr Postnikov soobshchil o planakh zakupki novykh vooruzhenii'.
[171] http://vpk.name/i19152.html, 26 June 2013.
[172] htto://ria.ru/defense_safety/20151117/1322711957.html, 17 November 2015, '"Uralvagonzavod" peredast VS poriadka 20 noveishikh tankov T-14 "Armata"'.
[173] http://top.rbc.ru/business/15/09/2015/55f803ad9a79477dcebec447, 15 September 2015.
[174] Frolov (2014).
[175] http://vpk.name/i140088.html, 10 September 2015, 'Minoborony RF planiruet modernizirovat okolo 400 tankov T-90'.

Original plan was to build 1 775 over five years from 2011.[176] Assembly began at KamAZ but the works decided to withdraw from the project, which was then moved to Voronezh. The plan was revised and a decision taken in 2013 that the army did not need the 'Rys' after all.[177]

'Tigr-M' VPK-2331 (Voenno-promyshlennaia kompaniia' of 'Russkie mashiny'; AO 'Arzamasskii mashinostroitelnyi zavod')

'Taifun-U' armoured vehicle (Miass AO 'Avtomobil'nyi zavod 'Ural';

'Taifun-K' armoured vehicle (AO 'KamAZ')

S? It is possible that the 'Taifun-K' programme will be affected by Western sanctions as some components may have been supplied by Timoney Technology Ltd. of Ireland. See 'Bumerang', below. In addition, imported Allison gearboxes.[178] The 'Taifun-U' has fewer imported components.[179]

BTR-82A ('Voenno-promyshlennaia kompaniia' of 'Russkie mashiny')

BTR-80A (AO 'GAZ')

BMP-3 (AO 'Kurganmashzavod')

In 2015 the MOD concluded a contract for delivery in 2015–2017 of 200+ BMP-3s.[180]

'Kurganets-25' platform, tracked armoured vehicles (AO 'Kurganmashzavod')

A new family of armoured vehicles now under development. Serial production may begin in 2017.[181]

VPK-7829 'Bumerang' platform, wheeled armoured vehicle, personnel carrier ('Voenno-promyshlennaia kompaniia' – AO 'Arzamasskii mashinostroitelnyi zavod')

[176] Bumagin, Viktor (2011) 'Strasti po voennomu vnedorozhniku', http://nvo.ng.ru/armament/2011-06-03/9_offroad.html, 3 March.
[177] http://bastion-karpenko.narod.ru/rus_M65.html, 'Bronemashin LMV M65 "Rys"'.
[178] Latypov, Timu (2015) 'Vse zhdut, chto sdelaet Shoigu: po golove pogladit ili nachnet golovy snimat?, 30 April 2015 (original Biznes online), http://vpk.name/i131186.html.
[179] http://www.armstrade.org/includes/periodics/news/2015/0325/101528426/detail.shtml, 25 March 2015, 'Na vooruzhenie VS RF mogut byt priniat oba variant broneavtomobilei "Taifun": "Taifun-U" i "Taifun-K"'.
[180] http://vpk.name/i140081.html, 10 September 2015, 'Proizoditel: Minoborony RF do kontsa 2017 goda poluchit bolshe 200 novykh BMP-3'.
[181]http://vpk.name/news/133981_seriinoe_proizvodstvo_btr_na_platforme_kurganec25_mozhet_nachatsya_v_2017_godu.html, 17 June 2015 (original ITAR-TASS).

In early 2012 it was expected that prototypes would go to troops in 2013, with mass deliveries from 2015.[182]

S? According to an Irish report, the 'Bumerang' programme is being negatively affected by Western sanctions on the Russian defence industry. The Irish company Timoney Technology Ltd., specialised in automotive systems for heavy and armoured vehicles, is involved in its development as a supplier of components according to a contract of 2011, including suspension, axles and automatic transmission. It is claimed that only three prototypes were assembled and sent to the Arzamas works before the imposition of sanctions – the three that were shown at the 9 May parade in Moscow. There has been no confirmation of this in Russia. It is also reported that Timoney has been involved in the Kamaz 'Taifun-K' programme.[183]

VPK-3927 'Volk' armoured vehicle ('Voenno-promyshlennaia kompaniia' – AO 'Arzamasskii mashinostroitelnyi zavod')

A new development to the order of the MOD, now being tested prior to serial production.[184]

'Skorpion LShA-2B' light armoured vehicle (AO 'Korporatsiia Zashchita')

A new development being tested by the MOD for supply to the army, with an agreement for the delivery of several tens.[185]

'Msta-S' self-propelled howitzer (AO 'Nauchno-proizvodstvennaia korporatsiia "Uralvagonzavod" im. F. E. Dzherzhinskogo' – 'Uralskii zavod transportnogo mashinostroeniia')

'Kornet' PTRK anti-tank missile complex (Tula KB priborostroeniia)

'Koalitsiia-SV SAU 2S35' heavy self-propelled gun (Nizhnii Novgorod TsNII 'Burevestnik', 'Uralskii zavod transportnogo mashinostroeniia')

'Tornado-G' MLRS (multiple rocket launch system) (AO 'Motovilikhinskie zavody')

'Ratnik' individual infantry combat system (integrated body armour, helmet, communications, with new AK-12 assault rifle) ('TsNIItochmash', concern 'Kalashnikov' and others)

[182] http://vpk.name/i65311.html, 22 February 2012, 'Glavkom SV Aleksandr Postnikov soobshchil o planakh zakupki novykh vooruzhenii'.
[183] http://bmpd.livejournal.com/12469227.html, 1 April 2015, 'Programma "Bumerang" stanovitsia zhertvoi sanktsii'.
[184] http://vpk.name/i137929.html, '"Volk" primut na vooruzhenie posle ispytanii' (original, *Rossiiskaia gazeta*).
[185] http://www.bmpd.livejournal/1436755.html, 19 August 2015, 'Korporatsiia "Zashchita" postavit Ministerstvu oborony partiiu bronirovannykh mashin "Skorpion LShA-2B"'.

BMD-4M 'Sadovnitsa' armoured combat vehicle for parachute troops (AO 'Kurganmashzavod')

BTR-MDM 'Rakushka' armoured personnel carrier for parachute troops (AO 'Kurganmashzavod')

First set of 12 to be delivered spring 2016.[186]

- *Ground forces air defence systems*

'S-300V4' (AO 'Kontsern vozdushno-kosmichekoi oborony "Almaz-Antei"') (export variant known as 'Antei-2500').

'Verba' man-portable air defence system ('NPK KB mashinostroeniya' of NPO 'Vysokotochnye kompleksy' ('Rostekh'))

- ***Sources of planned GOZ and implementation***
- *'Iskander-M' operational-tactical missile system*

GPV-2020 total: 10 brigade sets, Litovkin, Viktor (2013) 'Podarok k dniu artillerii', http://nvo.ng.ru/ concepts/2013-11-15/1_gift.html, 15 November.

2010P: http://kremlin.ru/news/11206, 10 May 2011 (Medvedev).

2010A: http://www.armstrade.org/includes/periodics/news/2011/0801/12509052/detail.shtml, 1 August 2011.

2011A: Frolov (2014). According to source of 2013, in 2010–2011 a brigade set was formed at Luga, Leningrad oblast.

2013 P, A: http://bmpd.livejournal.com/1388108.html, 17 July 2015, 'Sukhoputnye voiska Rossii poulchili shestoi brigadnyi komplekt "Iskander-M" (Birobidzhan; Krasnodar)

2014A, P: as 2013 (Shue, Ivanovo obl.; Totsoe-2, Orenburg obl.)

2015P: http://function.mil.ru/news_page/country/more.htm?id=12005581@egNews 13 January 2015 (Shoigu).

2015A: http://bmpd.livejournal.com/1586187.html, 10 November 2015, 'Brigadnyi komplekt "Iskander-M" dlia novoi raketnoi brigady v Mozdoke'.

[186] http://www.armstade.org/includes/periodics/news/2015/1123/115032295/detail.shtml, 23 November 2015, 'VDV Rossii vesnoi 2016 goda poluchat pervuiu seriinuiu partiiu BTR-MD "Rakushka"'.

(Ulan-Ude; Mozdok, Northern Ossetia; by end 2015 7 brigade sets of the 10 of GPV-2020).

- *Main battle tanks*

GPV-2020 total: Kropotkin, Mikhail (2013) 'Dostizhenie i nedorabotki ruka ob ruku', *VVP RF*, 2013, No. 4, http://www.vvprf.ru/archive/clause811.html, plus T-90A?

T-90A

2010P: Nikolskii, Aleksei (2010) 'Proshchai, staroe oruzhie', *Vedomosti*, 20 April.

2010A: Frolov (2014).

T-14 'Armata' main battle tank

GPV-2020 total: Kropotkin, Mikhail (2013).

- *Armoured vehicles*

2014A: http://vpk.name/news/124232_armiya_rossii_uvelichila_svoi_boevyie_vozmozhnosti_v_13_raza_za_2014_god.html, 31 December 2014.

2015P: http://function.mil.ru/news_page/country/more.htm?id=12005581@egNews, 13 January 2015 (Shoigu).

Iveco LMV M65, 'Rys'

2011A, 2012A, 2013A: Frolov (2014).

2013P: http://function.mil.ry/news_page, 26 December 2013, 'Zamestitel Ministerstvo oborony Rossii Yurii Borisov vstretilsia s prestaviteliami SMI'.

'Tigr-M' VPK-2331

2011A, 2012A, 2013A: Frolov (2014).

2012P: http://vpk.name/i68602.html, 3 May 2012.

'Taifun-U' armoured vehicle

2014A: http://vpk.name/i128841.html, 24 March 2015, 'Bronemashiny "Taifun" proidut voiskovye ispytaniia do kontsa goda'. Trial batch.

'Taifun-K' armoured vehicle

2014A: http://vz.ru/news/2014/12/24/721984.html, 24 December 2014. Trial batch.

BTR-82A

2011P: http://www.armstrade.org/includes/periodics/news/2011/0801/12509052/detail.shtml, 1 August 2011 (new only, in addition 134 modernised).

2013A: Frolov, (2014).

BTR-80A

2012A: Frolov (2014).

BMP-3

2010P: Nikolskii, Aleksei (2010).

2012A, 2013A: Frolov (2013).

2015: May 2015, MOD order placed for order for 'several hundred' over three years: http://lenta.ru/news/2015/05/12/bmp3/, 12 May 2015, 'Minoborony kupit neskolko soten BMP-3 za tri goda'.

- *Self-propelled artillery and ordnance*

GPV-2020 total: as tanks

'Msta-S' self-propelled howitzer

2020 GPV total: http://www.armstrade.org/includes/periodics/news/2011/0801/12509052/detail.shtml, 1 August 2011.

2010A: as GPV-2020 total.

2012A: Frolov (2014).

2013A: Riabov, Kirill (2013) 'Itogi 2013 goda: perevooruzhenie, sotrudnichestvoi razvitie', http://topwar.ru/37777-oitogi-2013-goda-perevooruzhenie-sotrudnichestvo-i-razvitie.html, 31 December.

'Kornet' PTRK anti-tank missile complex

2010A, 2012A: Frolov (2014).

'Koalitsiya-SV SAU 2S35' heavy self-propelled gun

2013A, 2014P: http://www.arms-expo.ru/news/novye_razrabotki/koalitsiya_sv_poluchit_novyy_vysokotochnyy_boepripas/, 18 May 2015.

'Tornado-G' MRLS multiple rocket launch system

2011A, 2012A: Frolov (2014).

- *Automobiles*

GPV-2020 total: as tanks

2010A, 2012A: Frolov (2013).

2011A: http://www.function.mil.ru/for_media/press_conferences, 24 January 2012 (A. Sukhorukov)

2013A: Riabov, Kirill (2013).

2014A:
http://vpk.name/news/124232_armiya_rossii_uvelichila_svoi_boevyie_vozmozhnosti_v_

13_raza_za_2014_god.html, 31 December 2014

2015P:
http://function.mil.ru/news_page/country/more.htm?id=12005581@egNews

13 January 2015 (Shoigu).

2015A: http://function.mil.ru/files/morf/2015-12-11_MoD_board_extended_session_ RUS.pdf , 11 December 2015, 'Tezisy doklada Ministra oborony Rossiiskoi Federatsii na rashshirennom zasedanii Kollegii Minoborony Rossii'.

'Ratnik' individual infantry combat system

2015P: http://vpk.name/i132666.mhtml, 27 May 2015, 'Bochkarev: VS RF v 2015 i 2016 godakh poluchat po 50 tysiach "Ratnikov"' (also 50 000 sets in 2016).

BMD-4M 'Sadovnitsa' armoured combat vehicle for parachute troops

GPV-2020 total: Kropotkin, Mikhail (2013) Note, 2015–2018 250+ BMD-4M and 'Rakushka' to be procured: http://www.vpk-news.ru/news/25206, 13 May 2015, 'Minoborony RF poluchit svyshe 250 BMD-4M i BTR "Rakushka"'. To 2025 VDV to receive 1 500+ BMD-4M, http://www.odnako.org/blogs/vdv-rossii-do-konca-goda-poluchat-50-boevih-mashin-desanta-bmd-4dm/, 29 July 2015.

2011P: http://ria.ru/defense_safety/20110802/410773740.html, 2 August 2011.

2011A: Frolov (2014).

2013P: 10, then reduced to7, Litovkin, Viktor (2013a) 'Armiiu kusaiut tseny', *Nezavisimaia gazeta*, 25 April.

2013A: Frolov (2014).

2015P: 62, as 2015–2018 total; 50, http://www.odnako.org/blogs/vdv-rossii-do-konca-goda-poluchat-50-boevih-mashin-desanta-bmd-4dm/, 29 July 2015.

BTR-MDM 'Rakushka' armoured personnel carrier for parachute troops

To 2025 VDV to receive 2 500+ 'Rakushka', http://www.odnako.org/blogs/vdv-rossii-do-konca-goda-poluchat-50-boevih-mashin-desanta-bmd-4dm/, 29 July 2015.

2011P: as BMD-4M

2015P: 22, as BMD-4M; 30, as BMD-4M.

- *Ground forces air defence systems*

'S-300V4'

GPV-2020 total: 9 brigades, Gavrilov, Yurii (2015) 'Sobet i nevidimku', *Rossiiskaia Gazeta*, 2 July.

2012A, 2013A: Frolov (2014).

2014A: http://function.mil.ru/news_page/country/more.htm?id=12004148@egNews, 19 December 2014, 'Otchet na rashirennom zasedanii kollegii MO Rossii ob itogakh deiatelnosti za 2014g'.

'Verba' man-protable air defence system

2014A, 2015A: http://vpk.name/i145195.html, 30 November 2015, 'Minoborony poluchilo noveishii perenosnoi zenitnyi raketnyi kompleks "Verba"'; in each year 2 brigade sets for ground forces and 2 division sets for VDV.

A5 Navy

- ***Systems and notes***
- *Nuclear submarines*

Strategic nuclear, 'Borei' class (project 955, 955M) (St. Petersburg TsKB MT 'Rubin'; Severodvinsk 'Sevmash'; Nizhnii Novgorod 'OKBM im. I.I. Afrikantov' (reactor units))

As of mid-2015, 3 'Borei' class submarines had been built, with 3 more under construction ('Kniaz Vladimir', 'Kniaz Oleg' and 'Generalisimus Suvorov'). The seventh ('Imperator Aleksandr III') will be laid down in December 2015; the eighth ('Kniaz Pozharskii') in July 2016.[187]

[187] http://vpk.name/i135383.html, 6 July 2015, 'Vosmoi raketonosets serii "Borei" "Kniaz Pozharskii" zalozhat v iiule 2016 goda – istochnik' (original Interfaks-AVN); http://www.vpk-news.ru/news/28235, 27 November 2015, 'Sedmoi podvodnyi raketonosets tipa "Borei" "Imperator Aleksandr III" budet zalozhen 18 dekabria'.

Table 21. Naval equipment

	2010 GOZ	2011 GOZ	2012 GOZ	2013 GOZ	2014 GOZ	2015 GOZ	GPV-2020 Total
All ships & boats, all types						50+/47	
Submarines							c.20
Nuclear	3/	3/	3/-	3/3	2/2		
Nuclear strategic							
Pr.955/A 'Borei' class		2/-	2/-	2/2	1/1		8
Nuclear multi-role							
Pr.855/M 'Yasen' class		1/-	1/-	1/-	1/1		7
Diesel-electric							
Pr.677 'Lada' class	/(1)						8-10,?
Pr.636 'Varshavyanka' c					2/2	1/1	?, 6-10/6

Surface ships							100
Warships							
Total	3/2	4/2	3/1	7/5	12/7	5,12/8	50+
Aircraft carrier							2026-7
Destroyer							2017,19
Corvettes							c.35
Pr.20380 'Steregushchii' c	1/0	1/1	1/-	1/1	1/1	1?/ **S**	20
Pr.20835 'Gremiashchii' c						1/- **S**	16,2
Frigates							15
Pr.22350,'Gorshkov' class		1/-	1/-	1/-	1/-	2/	9,6
Pr.11356R 'Grigorovich' c					2/-	2/- **U**	6,9?
Small artillery ships							
Pr.21630 'Buian'		1/1					
Pr.21631 'Buian-M'				2/2	1/1	2/2 **S**	8-10
Guard ship							
Pr.11661 'Gepard' class			1/1				
Landing craft							10
Pr.11770	1/1			2/2	1/1		
Pr.11711 'Ivan Gren'		1/-				1/	
Pr. 21820 'Diugon''	1/1			1/-	4/4		
'Mistral' class					1/-	2/-	4
Minesweeper							
Pr. 12700 'Aleksandrit' c						1/1	

Auxiliary vessels							
Total					/21	14/	96
Intelligence ship							
Pr.18280 'Delfin' class					1/-	1/1	
Rescue ship							
Pr. 21300						1/	
Oceanographic ship							
Pr.22010 'Kriuis' class						1/1	
Sea-going support ship							
Pr. 23120 'Elbrus' class						1/	8
Shore missile complexes							
Bastion	/1-2	/1				1/	} c.20
Bal-E		/1			/2		}
Cruise missiles							
'Kalibr' 3M 14							

Notes: ../... planned number in GOZ for year/actual number procured by armed forces. **S** denotes Sanctions, .i.e. a comment relating to the impact of NATO and EU sanctions on specific weapon systems. **U** denotes Ukraine, .i.e. a comment relating to the impact of the breakdown of supplies from Ukraine on specific weapon systems.

Multi-role nuclear, 'Yasen' class (project 677, 677M) (St. Petersburg MBM 'Malakhit'; Severodvinsk 'Sevmash'; Nizhnii Novgorod 'OKBM im. I.I.Afrikantov' (reactor units))

Note: the full series of 7 will not be completed until after 2023.[188]

- *Diesel-electric submarines*

'Lada' class (project 677) (St. Petersburg TsKB MT 'Rubin'; St Petersburg 'Admiralteiskie verfi')

GPV-2020 total: 8–10; later revised down, 4–5? Two Lada-class submarines are under construction but it appears that no more will be built until the development of a new air-independent power unit has been completed.[189] It is claimed that the first submarines with the new power unit will be received by the navy before the end of 2020.[190]

'Varshavyanka' class (project 636.3) (St. Petersburg TsKB MT 'Rubin'; St Petersburg 'Admiralteiskie verfi')

Before end 2017 Black Sea Fleet to receive 4 project 636.3 submarines armed with 'Kalibr' cruise missiles.[191] In late 2015 it was announced that more pr.636.3 submarines may now be built for other fleets, probably because of problems with the 'Lada' programme.[192]

- *Surface ships and boats*

Warships

- *Aircraft carrier*

Not in GPV-2020 but design work on a nuclear-powered carrier underway at the Nevskoe PKB, St Petersburg on an 'imitative' basis.[193] Navy plans for building first new aircraft carrier by 2026–2027.[194]

[188] http://vpk.name/i133978.html, 17 June 2015, '"Malakhit" rabotaet nad proektom atomnykh podvodnykh lodok piatogo pokoleniia'.
[189] http://vpk.name/i134022.html, 17 June 2015, 'Seriinye podlodki "Lada" budut zakladyvatsia s anaerobnoi ustanovki' (original *Voenno-promyshlennyi kurer*).
[190] http://www.vz.ru/news/2015/10/23/773988.hyml, 23 October 2015, 'Peredacha VMF podlodki s anaerobnymi ustanovkami zaplanirovana dokontsa 2020 goda'.
[191] http://www.rg.ru/2015/10/23/kalibr-site.html, 23 October 2015, 'Vse floty Rossii poluchat novye korvety s raketami "Kalibr-NK"'.
[192] http://vpk.name/i143720.html, 6 November 2015, 'VMF RF mozhet prodolzhit proekt podlodok "Varshavianka"'.
[193] http://www.vz.ru/news/2015/8/10/760401.html, 'OSK: Perspektivnyi rossiiskii avianosets budet atomnym'.
[194] http://vpk.name/i132925.html, 1 June 2015, 'MF Rossii planiruet postroit k 2027 godu perspektivnyi avianosets'.

- *Destroyer*

(St. Petersburg PKB 'Severnoe'; St. Petersburg 'Severnaia verf''?)

'Lider' type (project 23560E) under development since 2014, prototype to be laid down in late 2017, but first for navy not until 2023–2025, with a possible total build of 12, but an initial order of 6. Nuclear propulsion.[195] However, in June 2015, according to navy chief Viktor Chirkov, building of the 'Lider' will begin in 2019.[196]

- *Corvettes*

Project 20380 corvette 'Steregushchy' class (St. Petersburg TsMKB 'Almaz'; St. Petersburg 'Severnaia verf'' and 'Amurskii sudostroitelnyi zavod')

S. Building of corvettes at Amurskii zavod has been delayed by sanctions and the non-delivery of a number of imported components.[197]

Project 20385 corvette 'Gremyashchy' class (St. Petersburg TsMKB 'Almaz'; St. Petersburg 'Severnaia verf'')

S. Project 20385 have German MTU diesel power units. Two under construction will be completed, with engines supplied by AO 'Kolomenskii zavod', but the building of planned new vessels will end. Future corvettes will be built to project 20380.[198] Curtailment of the supply of MTU power units will also impact on the building of project 21980 'Grachonok' class anti-diversion boats (a series nine have been built or are under construction); and project 21361 'Buyan-M' class missile boats (below). A Chinese replacement was considered but a decision then made to supply Russian-built engines and power trains but this will delay the completion of vessels currently under construction.[199]

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[195] http://www.armstrade.org/includes/periodics/news/2015/0220/1620279/detail.shtml, 20 February 2015, 'Zakladka esmintsa novogo pokoleniia tipa "lider" zaplanirovana na konets 2017 goda'; http://www.vz.ru/news/2014/9/16/705844.html, 'Bochkarev: Perspektivnyni esminets tipa "lider" budet sozdan v Rossii cherez tri goda', 16 September 2014; http://www.rbc.ru/rbcfreenews, 21 October 2014, 'Perspektivnyi esminets "Lider" mozhet byt sozdan ne ranee 2023–2025 godov'; http://www.vz.ru/news/2015/5/19/746008.html, 19 May 2015, 'Esminets "Lider" peredumali delat v gazoturbinnom variante'; http://vpk.name/news/132291_esmincyi_proekta_lider_veroyatno_budut_stroitsya_na_s–evernoi_verfi.html, 21 May 2015.

[196] http://www.armstrade.org/includes/periodics/news/2015/0622/103=29793/detail.shtml, 'Viktor Chirkov: k stroitelstvu esmintsa "Lider" planiruetsia pristupit v 2019 godu'.

[197] http://lenta.ru/news/2015/03/23/corvettes, 23 March 2015, 'Voennye soobshchili o sryve srokov sdachi flotu korvetov'.

[198] http://bmpd.livejournal.com/, 21 May 2015, 'Stroitelstvo lorvetov proekta 20385 ogranichitsia dvumia korabliami'; http://vpk.name/i128370.html, 17 March 2015, 'TsMKB "Almaz": VMF Rossii poluchit korvety proekta 20385 v srok i s rossiiskimi dvigateliami'.

[199] http://vpk.name/i129182.html, 30 March 2015, 'Protivodiversionnye katera "Grachonok" budut osnashchatsia kitaiskimi dvigateliami'; http://vpk.name/i144708.html, 23 November 2015, 'Novyi

- *Frigates*

Project 22350 (St. Petersburg Severnoe PKB; St Petersburg 'Severnaia verf'')

Project 11356 (St. Petersburg Severnoe PKB; Kaliningrad 'Yantar')

U. Gas turbine power units and transmissions for project 11356 frigates are supplied by 'Zorya – Mashproekt', Mykolaiv/Nikolaev, Ukraine. Before Ukraine broke off defence related supplies, three had been delivered. For the remaining three ships of the series an alternative power unit (M-90RF) is being developed by Rybinsk 'Saturn', with a power transmission developed by AO 'Zvezda' in St. Petersburg.[200] The R&D cost alone will be 1.7 bn.r.[201] This will lead to a delay in the completion of the frigates, the first now expected in 2020.[202] Initially it was decided to that frigate project 11356 would be replaced by a new small artillery ship, project 22800, the first to be laid down in 2016, with a total build of 18.[203] However, since then, as noted above, it has been decided to complete building the series of frigates. 'Saturn' is also preparing for the production from 2016 of engines (M-70) for landing craft and patrol boats.[204] The project 22800s will still be built (as below).

- *Small artillery ships*

Project 21630 'Buyan' class (Zelenodolsk PKB, St. Petersburg sudostroitelnyi zavod 'Almaz')

Project 21631 'Buyan-M' class (Zelenodolsk PKB, 'Zelenodolsk sudostroitel'nyi zavod im. A.M. Gorkogo')

S. Have German MTU diesel engines, see project 20385 corvettes, above. Will not affect the two vessels being handed over in 2015.

Project 22800 small artillery ships (St. Petersburg KB 'Almaz')

New development, sometimes called a light corvette. 18 to be built at several enterprises, armed with 'Kalibr-NK' cruise missiles. [205]

"Grachonok" i "Buian-M" soidut so stapelei zavoda s rossiiskimi dvigateliami' (original ITAR-TASS).

[200] http://vpk.name/i132490.html, 25 May 2015, 'OSK: stroiashchie fregaty proekta 11356 osnastiat rossiiskimi dvigateliami vzamen ukrainskikh'.

[201][201] http://bmpd.livejounral.com/1380124.html, 11 July 2015, 'Deiatelnost NPO "Saturn" v 2014 godu, vkliuchaia programmy korabelnykh gazovykh turbin'.

[202] Vladimir Gutenev (2015) Serdtse korablia budet rossiiskim', 24 November, http://rg.ru/2015/11/24/dvigatel.html.

[203] http://vpk.name/i135230.html, 3 July 2015, 'Vozmozhnyi oblik malogo raketnogo korablia proekta 22800'.

[204] http://www.armstrade.org/includes/periodics/news/2015/0714/124040156/detail.shtnl, 14 July 2015, 'ODK nachnet seriinoe proizvodstvo dvigatelei dlia desantnykh korablei v 2016 godu'.

[205] http://www.rg.ru/2015/10/23/kalibr-site.html, 23 October 2015, 'Vse floty Rossii poluchat novye korvety s raketami "Kalibr-NK"'.

- *Guard ship*

Project 11661 'Gepard' class (Zelenodolsk PKB, 'Zelenodolsk sudostroitelnyi zavod im. A.M. Gorkogo')

- *Landing craft*

Project 11770 'Serna' class air cavity landing craft ('Nizhnii Novgorod TsKB posudam napodvodnykh kryliakh im. R. E.Alekseeva'; Nizhnii Novgorod sudostroitelnyi zavod 'Volga')

Project 11711 'Ivan Gren' class (St. Petersburg 'Nevskoe' PKB, Kaliningrad 'Yantar')

Originally 5 were to be built, later reduced to 2.[206]

Project 22180 'Diugon' class ('Nizhnii Novgorod TsKB posudam napodvodnykh kryliakh im. R. E. Alekseeva'; 'Yaroslavl sudostroitelnyi zavod')

'Mistral' class amphibious assault ship (DCNS, STX Europe, Saint Nazaire, France/'Baltiiskii zavod', St. Petersburg)

GPV-2020 total: 4, 2 purchased from France; 2 to be built in Russia. Inter-government agreement on purchase signed January 2011; contract June 2011.[207] First, 'Vladivostok' launched October 2013; handover scheduled for November 2014 but did not take place because of Ukraine-related sanctions. Second, 'Sevastopol', completed in May 2015. Deal finally abandoned and €950 million refunded by early August 2015, leaving France free to find alternative buyers after some Russian equipment has been removed from the ships.[208] In October they were sold to Egypt and will have Russian-supplied helicopters. According to the head of OSK, there has been no request from the navy for the building of an alternative vessel.[209]

[206] http://vpk.name/i132365.html, 22 May 2015, 'V iune nachnutsia ispytaniia BDK "Ivan Gren" i budet zalozhen odnotipnyi korabl'.

[207] Safronov, Ivan & Goriashko, Sergei (2015) 'Mistral vystupil v morskoe rastoriazhenie', *Kommersant Daily*, 15 May.

[208] http://top.rbc.ru/politics/03/09/2015/55e786029a7947520ff0e646, 3 September 2015, 'Frantsuskii parlament nazval tochnuiu summu kompensatsii za "Mistrali"'. http://www.1prime.ru/industry_and_energy/20150530/811576814.html, 30 May 2015, 'SMI: Frantsiia zavershila stroitelstvo vtorogo "Mistralia"'; http://www.rg.ru/2015/08/05/mistrali-site-anons.html, 5 August 2015, 'Putin i Oland uregulirovali vopros "Mistralei"; Safronov, Ivan & Goriashko, Sergei (2015a) 'Dengi za Mistral priplyli', *Kommersant Daily*, 6 August.

[209] http://i140571.html, 17 September 2015, 'OSK ne poluchala zaprosov na sozdanie analoga "Mistralia" dlia VMF RF'.

- *Minesweeper*

Project 12700 'Aleksandrit' class coastal minesweeper (St. Petersburg TsMKB 'Almaz'; St. Petersburg 'Sredne-Nevskii sudostroitelnyi zavod')

- *Intelligence ship*

Project 18280 large intelligence ship (St. Petersburg TsKB 'Aisberg', St. Petersburg 'Severnaia verf')

Oceanographic research ship

Project 22010 'Kriuis' class (St. Petersburg TsMKB 'Almaz', Kaliningrad sudostroitelnyi zavod 'Yantar')

- *Rescue ship*

Project 21300 'Delfin' class (St. Petersburg TsMKB 'Almaz', St. Petersburg 'Admiralteiskie verfi')

- *Sea-going support ship*

Project 23120 'Elbrus' (St. Petersburg 'Severnoi verfi')

Shore-based anti-ship missile systems

'Bal-E' (AO 'Korporatsioa takticheskoe raketnoe vooruzhenie' – 'KB Mashinostroeniia')

'Bastion' (AO 'Korporatsiia takticheskoe raketnoe vooruzhenie' – 'NPO mashinostroenie')

Has 24 'Oniks' anti-ship cruise missiles produced by Orenburg NPO 'Strela', range 300–500 km. By 2020 the first silo-based 'Bastion' missile complex will be deployed in Crimea.[210]

- *Naval cruise missiles*

'Kalibr-NK' 3M14 long-range sea-land cruise missile (Yekaterinburg OKB 'Novator' of Kontsern 'PVO "Almaz –Antei"')

Range up to 2 000 km.; warhead conventional or nuclear; flight ceiling, over land, 50 to 150 m., sea, 20 m. First deployed in 2012 on guard ship 'Dagestan'. There is a submarine-launched variant, 'Kalibr-PL'. First used in conflict in Syria.[211]

[210] http://www.vpk.news.ru/news/25931, 2 July 2015, 'Pervyi shakhtnyi "Bastion" budet razvernut v Krymu do 2020 goda'.

[211] Klimov, Maksim (2015) 'Benefis "kalibrov"', http://www.vpk-news.ru/articles/27516, 14 October; Ptichkin, Sergei (2015) 'Boevoe kreshchenie "Kalibra"', http://www.rg.ru/2015/10/09/rakety.html, 9 October; http://navy-korabel.livejournal.com/86469.html, 26 March 2015, 'Krylataia raketa 3M14 kompleksa "kalibr" – nash "Tomagavk" ili vtoroe prishestvie "Granata";

- *Naval aviation*

Note, aircraft included in air forces table.

However, by 2020 21 new fixed wing aircraft and 54 helicopters.[212]

- ***Sources of planned GOZ and implementation***

- *All ships and boats, all types*

2015P: 50, http://armstrade.org/includes/periodics/news/2015/0601/105029428/shtml, 1 June 2015, 'Viktor Chirkov: VMF Rossii v 2015 godu poluchit bolee 50 korablei razlichnogo klassa'; 47, http://tass.ru/armiya-i-opk/2372759, 23 October 2015, 'Zamestitel glavkoma: plan VMF Rossii na 2015 god po zakladke sudov vypolnen na 75%'.

- *Submarines*

All submarines, nuclear and diesel-electric

GPV-2020: c.20: http://www.redstar.ru/2011/02/25_02/1_01.html, 25 February 2011 (V. Popovkin)

Nuclear

2010P: http://kremlin.ru/news/11206, 10 May 2011 (Medvedev).

2011P: Litovkin, Dmitrii (2010) 'Trillion rublei na reformu armii', *Izvestiia*, 9 December, http://izvestia.ru/news/368980.

Strategic nuclear, 'Borei' class (project 955,955M)

GPV-2020 total: Tikhonov, Aleksandr (2011).

2011P: http://www.kremlin.ru/news/10677, 19 March 2011 (Serdiukov)

2012P: http://www.armstrade.org/includes/periodics/news/2012/0209/11511526/detail.shtlm, 9 February 2012.

2013P; 2013A, 2014P, 2014A: http://militaryrussia.ru/blog/topic-338.html, 'pr.955 – BOREI/DOLGORUKIY', accessed 20 May 2015. (2013, 'Yurii Dolgorukii' – laid down 1996, 'Aleksandr Nevskii' – laid down 2004; 2014, 'Vladimir Monomkah' – laid down 2006).

http://www.gazeta.ru/politics/news/2015/10/24/ n_7808201.shtml, 24 October 2015, 'VMF: krylatye rakety "kalibr" sposobny porazit tsel s 2 tysiach kilometrov'.

[212] http://www.armstrade.org/includes/periodics/news/2013/0902/124020090/detail.shtml, 2 September 2013, 'Morskaia aviatsiia VMF RF do 2020 goda poluchit bolee 70 novykh samoletov i vertoletov'.

2015P: the 2 formally handed over in 2014 to be made combat ready, http://www.ng.ru/armies/2014-12-20/100_collegium.html, 20 December 2014. ‘Aleksandr Nevskii’, with 16 ‘Bulava’ missiles, achieved this status April 2015, http://vpk.name/i130157, 15 April 2015, ‘Atomnaia podlodka “Aleksandr Nevskii” priniata v sostav boegotovykh sil VMF Rossii’.

Multi-role nuclear, ‘Yasen’ class (project 677, 677M)

GPV-2020 total:
http://www.armstrade.org/includes/periodics/news/2013/0319/152517582/detail.shtml, 19 March 2013.

2011P: http://www.kremlin.ru/news/10677, 29 March 2011 (Serdiukov).

2012P: http://www.militaryparitet.com/teletpye/data/ic_teletype/13666/, 26 January 2012.

2013P:
http://www.armstrade.org/includes/periodics/news/2013/0423/113518158/detail.shtml, 23 April 2013

2013A, 2014P, 2014A: adopted on a trial basis in 2013; fully into fleet June 2014. http://militaryrussia.ru/blog/topic-339.html, ‘pr.885 – GRANAY’, accessed 20 May 2015. (‘Severodvinsk’ – laid down 1993).

Diesel-electric

‘Lada’ class (project 677)

GPV-2020 total: 8–10; later revised down, 4–5?

2010A: adopted by navy on trial basis, http://militaryrussia.ru/blog/ (pr.677 – LADA), accessed 15 May 2015.

‘Varshavianka’ class (project 636)

GPV-2020 total: initial goal not known, later increased to ‘up to 10’, including 6 for Black Sea Fleet, Shcherbakov, Vladimir (2012) ‘Korabelnyi nedobor’, *Voenno-promyshlennogo kurer*, No. 6) (Plus first Sankt P only trial, not handover to navy). In 2015 stated that after the completion in 2017 of 6 for the Black Sea Fleet no more will be built, http://www.vz.ru/news/2015/9/4/765047.html, 4 September 2015, ‘Minoborony zaiavilo o prekrashchenii stroitelstva podlodok proekta 636 “Varshavianka”’.

2014P; 2014A: http://militaryrussia.ru/blog/topic-722.html, ‘pr.636 – IMPROVED KILO’, accessed 20 May 2015. (‘Novorossiisk’ – laid down 2010; ‘Rostov-na-Donu’ – laid down 2012).

2015P: http://topwar.ru/70492-na-baltike-startovali-zavodskie-hodovye-ispytaniya-podvodnoy-lodki-staryy-oskol-proekta-6363-varshavyanka.html, 7 March 2015. (‘Staryi Oskol’ – laid down 2012).

2015A: http://www.armstrade.org/includes/periodics/news/2015/0703/114530010/detail.shtml, 3 July 2015, 'DEPL "Staryi Oskol" voshla v boevoi sostav VMF Rossii'.

- *Surface ships and boats*

GPV-2020 total: Safronov, Ivan (2011) 'Minoborony pereshlo ot slov k 19 trillionam', *Kommersant Daily*, 25 February.

- *Warships*

GPV-2020 total: Putin, V. (2012).

Actual each year: total of identified ships handed over to navy. It is assumed that if a ship is handed over to the navy it will have been in the GOZ for the year.

2015P: 5, http://min-oboron.ru/novosti/ministr-oborony-rossii-general-armii-sergej-shojgu-provel-pervoe-v-novom-godu-selektornoe-soveshhanie-s-rukovodyashhim-sostavom-vooruzhennyx-sil.html, 21 January 2015. Appears to refer to corvettes and frigates only; 12, http://www.flotprom.ru/2015/Оборонка202/, 10 July 2015, 'Minoborony RF: sokhraniaetsia risk sryva srokov sdachi korablei v tekushchem godu'.

2015A: http://function.mil.ru/files/morf/2015-12-11_MoD_board_extended_session_RUS.pdf, 11 December 2015, 'Tezisy doklada Ministra oborony Rossiiskoi Federatsii na rashshirennom zasedanii Kollegii Minoborony Rossii'.

- *Corvettes*

GPV-2020 total: 35, Tikhonov, Aleksandr (2011).

Project 20380 corvette 'Steregushchy' class

GPV-2020 total: http://militaryrussia.ru/blog/index-534.html, 'pr.20380 – STREGUSHCHY', accessed. 20 May 2015.

2010P: http://kremlin.ru/news/11206,10 May 2011 (Medvedev) (not delivered).

2011P: Litovkin, Dmitrii (2010).

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GPV-2020 total: 16, Gavrilenko, Andrei (2013) 'Andreevskii flag nad Rossii', http://www.redstar.ru/index.php/newspaper/item/10505-andreevskij-flag-nad-rossiej, 26 July; 8 by 2018, Kramnik, Ilia (2014) 'Flot kak zerkalo politiki', http //arsenal-otechestva.ru/article/390-fleet-politics, *Arsenal Otechestva*, No. 6 (revised to 2 because of sanctions, below).

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GPV-2020 total: Tikhonov, Alekdandr (2011).

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GPV-2020 total: 6, as project 22350; 9?, http://vpk.name/news/93473_fregatyi_dlya_baltflota_Pochemu_ikh_dolzhno_byit_i_budet_bolshe.html, 22 July 2013. 6 to 2016, Kramnik, Ilia (2014). In August 2015 announced that building the final three vessels would continue notwithstanding the end of delivery of Ukrainian power units; completion will await delivery of power units by NPO ‘Saturn’ of Rybinsk, provisionally scheduled for end of 2017–early 2018, http://www.armstrade.org/includes/periodics/news/2015/0811/145030543/detail.shtml, 11 August 2015, ‘PSZ “Yantar” vozobnovil stroitelstvo storozhevykh korablei “Admiralskoi serii”’.

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- *Small artillery ships*

Project 21630 ‘Buian’ class

2010P, 2011P, 2011A, 2012P, 2012A: http://militaryrussia.ru/blog/topic-394.html, ‘pr.21603 Buyan – BUYAN’, accessed 21 May 2015. (2011, ‘Volgodonsk’; accepted 2012, ‘Makhachkala’, but formally in fleet 2013.

Project 21631 ‘Buian-M’ class

GPV-2020 total: http://militaryrussia.ru/blog/topic-395.html, 'Pr.21631 – Buyan-M'; 10 by 2019, http://www.armstrade.org/includes/periodics/news/2015/1023/132531836/detail.shtml, 23 October 2015, 'VMF RF poluchit 10 MRK "Buian-M" s raketami "Kalibr"'.

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2015A: Undergoing state testing; to be handed over November 2015, http://www.armstrade.org/includes/periodics/news/2015/1019/104531738/detail.shtml, 19 October 2015, 'MRK "Serpukhov" i "Zelenyi Dol" po zavesrshenii gosispytanii v noiabre budut priniaty v sostave VMF'.

- *Guard ship*

Project 11661 'Gepard' class

2012P/A: http://militaryrussia.ru/blog/topic-438.html, 'pr.11661 – Gepard'), accessed 21 May 2015. ('Dagestan', laid down 1991)

- *Landing craft*

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Project 11711 'Ivan Gren' class

2011P, A: Ulianova, Zhanna & Kompaneets, Andrei (2012) 'Otkuda v iashchikakh "Kalashnikovy"'?, *Trud*, 25 January.

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2014P, 2014A: http://russianships.info/boevye/21820.htm, accessed 21 May 2015.

('Denis Davydov'; 'Ivan Kartsev' built Vladivostok 'Vostochnaia verf'; 'Leitenant Rimskii-Korsakov'; 'Michman Lermontov')

- *Minesweeper*

Project 12700 'Aleksandrit' class coastal minesweeper

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- *Auxiliary ships*

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- *Intelligence ship*

Project 18280 large intelligence ship

2013P, 2014P: http://militaryrussia.ru/blog/topic-731.html, ‘pr.18280’, accessed 21 May 2015.

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- *Oceanographic research ship*

Project 22010 ‘Kriuis’ class

2014P:
http://vpk.name/news/92639_noveishee_okeanograficheskoe_sudno_yantar_postupit_na_flot_v_2014m.htm.

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- *Rescue ship*

Project 21300 ‘Delfin’ class

2014P, 2014A: http://militaryrussia.ru/blog/topic-745.html, ‘pr.21300 – Delfin’, accessed 21 May 2015. (‘Igor Belousov’)

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- *Sea-going support ship*

Project 23120 ‘Elbrus’

GPV-2020 total: http://vpk.name/i134805.html, 29 June 2015, ‘Golovonoe sudnoobespecheniia dlia VMF RF spustili na vodu v Peterburge’ (first launched June 2015).

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GPV-2020, total,
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At the end of 2010 then President Medvedev approved the State Armament Programme for Russia for the years 2011 to 2020.

The aim of the programme was to increase the share of modern armaments held by the armed forces from 15 percent in 2010 to 70 per cent in 2020. Over the past five years the volume of new weapons procured has increased steadily. In 2014 the work of the defence industry began to be affected by the Ukraine crisis, while the performance of the economy began to deteriorate, putting pressure on state finances. It was decided to postpone for three years the approval of the successor state armament programme to 2025. Nevertheless, the implementation of the programme to date has secured a meaningful modernisation of the hardware of the Russian armed forces for the first time since the final years of the USSR.

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