Russian Naval Shipbuilding

Market and industrial structure

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Cover: A ceremony takes place at the Admiralty Shipyard in St Petersburg to launch the Project 636.3 submarine B-603 Volkhov of the Russian Pacific Fleet, 26 December 2019. Photo: Alexander Demianchuk / ITAR-TASS / TT.

Sammanfattning

Under president Vladimir Putins politiska ledning, har Ryssland återigen visat ett mer beslutsamt engagemang för sina marina stridskrafter och därmed också för sin skeppsbyggnadsindustri.

Tidigare och nuvarande beväpningsprogram liksom långtgående strukturella reformer från det sena 2000-talet till det tidigare 2020-talet har haft en viktig betydelse för Rysslands försök att få ordning på den militära delen av skeppsbyggnadsindustrin.

Den här studien utforskar marknaden för rysk skeppsbyggnadskonst och den nuvarande industristrukturen för skeppsbyggnadsindustrins militära del. Dessa två är viktiga faktorer för hur den ryska skeppsbyggnadsindustrin kommer att utvecklas under de kommande decennierna, och därför också för Rysslands förmåga att uppfylla sina geostrategiska och utrikespolitiska mål.

Nyckelord: Ryssland, industriell organisation, marknadsanalys, varvsindustri, skeppsbyggnadsindustri.

Summary

Under the political leadership of President Vladimir Putin, Russia has once again demonstrated a more determined commitment to its naval forces and, consequently, to its shipbuilding industry. Previous and current armament programmes and far-reaching structural reforms, from the late 2000s to the early 2020s, have been of great importance in Russia's attempts to bring order to the naval subset of the shipbuilding industrial branch.

This study explores the Russian shipbuilding market and the current industrial structure of the naval subset of the industry. These two are important determinants for not only how Russian shipbuilding will develop in the coming decades, but also Russia's ability to meet its geostrategic and foreign policy goals.

Keywords: Russia, industrial organisation, market analysis, shipyard industry, shipbuilding industry.

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1 Introduction

In Russia's geopolitical contest with other states—initially, different European countries, over the course of several hundreds of years; then Japan, at the turn of the 20th century; and the United States, since 1945—its naval forces have typically been referred to playing an auxiliary role in relation to more decisive land operations or troop movements. Throughout history, the keepers of Russia's naval traditions have therefore quite naturally been torn between the desire of their leaders to project the image of Russia as a great sea power and the reality of Russia as being essentially a land power. The creation of tension between policy driven by the perceived need for a powerful Russian naval fleet and the potential crowding out effect that such policy would have on other military branches is an issue that remains unresolved up to the present. One of the more obvious consequences of this dilemma is the lack of a clear strategy for Russia's future naval shipbuilding programmes, which in turn affects the domestic shipbuilding industry.

The prevailing interdependence between Russia's naval forces and the domestic shipbuilding industry works in the opposite direction as well. The contemporary technical state and economic condition of the industry are pivotal for determining which naval ships and vessels Russia can build at any given time. Since the political leadership of Russia, under President Vladimir Putin, chose to increase its commitment to the Naval Forces, it also had to take on long overdue and essential structural reforms of the shipbuilding industry, which had been in a deteriorating state since Soviet days.[1] In particular, the State Armament Programme 2011–2020 (GPV–2020) has indicated a more determined economic commitment to the entire shipbuilding industry.

Both before and during the implementation of the GPV–2020, the naval part of the shipbuilding industry was subjugated to large-scale structural reforms. Among other things, these reforms aimed to set up more functional and therefore more effective company groups, which could better comply with current requirements for modern shipbuilding and also take on construction of larger ships and vessels. Although minor changes to the structure might still take place and further large-scale structural reforms might occur in the future, it is nevertheless probable that the industry at large has been provided with a stable structure that will remain in place well into at least the 2030s.

The current industrial structure, combined with the market prospects for Russian-made ships and maritime structures, is thus an important determinant for Russian shipbuilding for the coming next decades, not least because current shipbuilding projects will be completed in the mid-2020s, at the latest. What might the market

[1] Tsypkin 2010:332.

prospects and the current industrial structure reveal about Russia's naval shipbuilding capability, and what are the market constraints for Russia's naval shipyards? Will Russia procure more of the same, or will it begin construction of larger ships?

1.1 Purpose and method

This study explores the Russian shipbuilding market and the current industrial structure of the naval subset of Russia's shipbuilding industry. It is not an assessment of performance, nor a prognosis of the outcome of current shipbuilding programmes. The two pivot points that the study revolves around are the current market structure and prospects for Russian-built ships and vessels, and the external and internal structures of the naval subset of the industry.

The specific purpose of the study is to map the basic context in which Russia's naval shipbuilding occurs and to uncover and analyse the mechanisms at this level that might have an impact on firm conduct as well as on firm and industry performance. The study aims to answer the following two research questions. First: In what way is the naval subset of Russia's shipbuilding industry restrained by tangible market constraints? And, second: What is the nature of the industrial structure of the naval subset of the Russian shipbuilding industry and what is its possible impact on the industry's further performance?

Analytical framework

The setup and approach of this study both draw foremost on ideas stemming from industrial organisation theory. At the core of the analytical framework is the 'industry structure–conduct–performance framework model', SCP, developed by Joe S. Bain back in 1959. This model envisages a simple causal relationship, running from structure through conduct to performance, with performance dependent on industry structure.[2] The underlying assumption of the model is that, in the end, it is the industry structure that determines the average profitability and either improves or erodes the attractiveness of an industry.

In this report, the focus is limited to the first part of the SCP model, which covers the structures of the industry and the market. Set in the context of the study object, the report studies the market structure and demand for Russian-built ships, vessels and maritime structures, and the organisation of major company groups and conglomerates related to naval shipbuilding.

[2] Bain 1959, 2nd ed., 1968:84.

Definitions

For the purpose of this study, the concept of 'industry' is here outlined as a set of firms or companies pursuing an identical or reasonably similar business activity or commercial enterprise that can be isolated from other business activities or comercial enterprises. In accordance with accepted norms and practices applied by, among others, governmental statistical agencies, it is merely the principal activity of a firm that determines its industrial affiliation.

Based on this general concept, the shipbuilding industry is here identified as the sum of all entities involved in maritime research and development, design and construction, shipbuilding and ship repair yards, maritime instrumentation, ship engineering or maritime electrical engineering and wiring. It thus encompasses the entire production chain, from research and development, design and construction, technical support, modernisation, and repair to disposal of ships and vessels. It is also involved in the design and construction of drilling platforms for the oil and gas industry and other large-scale maritime equipment.[3]

1.2 Sources

This report draws mostly on different Russian sources. The most visible exception is some source material related to the global shipbuilding industry that has been used in order to obtain some suitable benchmark data. As for the first subject of the study—Russia's shipbuilding market—quantitative and qualitative data from official policy programmes and doctrines have been central. The analysis of this subject also draws on analyses, interviews and similar material found to a large extent in Russian media.

The Consolidated Register of the Defence Industrial Complex

Regarding the second subject of the report—the structure of the naval subset of the Russian shipbuilding industry—several sources have been crucial. A starting point in identifying the key entities within the naval part of the shipbuilding industry is the Consolidated Register of the Defence Industrial Complex. This register is kept by Russia's Ministry of Industry and Trade for the purpose of providing an objective basis for policymaking with regard to the Russian defence industry. In the present text, it is referred to as the Consolidated Register, or simply as the Register.

Given its status as a central state planning instrument, the Register itself is not open-source material, and the author has therefore had to rely on secondary sources that refer to the Register.[4] What is publicly known about the Register is that it

[3] Ministerstvo promyshlennosti i energetiki Rossiiskoi Federatsii 2007.

[4] Pravitelstvo Rossiiskoi Federatsii 2004a.

includes organisations that in some form are involved in or deal with the development, production, repair, or disposal, of arms and military and special equipment, as well as some clothing production. It also contains entities whose assets include controlling stakes in such organisations.[5] A parent or holding company might therefore be listed together with its subsidiaries, if they satisfy the above-mentioned criteria. A necessary condition for including subsidiaries in the Register is that they are separate, distinct, legal entities for the purposes of taxation, regulation and liability. This excludes any possible branches a company might have set up; while being physically separate from the organisation's main office, a branch does not constitute a separate legal entity.

The List of Organisations Included in the Consolidated Register of the Defence Industrial Complex

The List of Organisations Included in the Consolidated Register of the Defence Industrial Complex is a document listing all entities that are included in the Consolidated Register. In contrast to the Consolidated Register, it has figured in the public domain. In this report, it is referred to as the List of Organisations, or just the List. The List has been released on an irregular basis, and the latest version that has emerged on the internet dates to July 2015.[6] If not stated otherwise, it is this version of the List that is used here as a point of departure for the analysis of the Russian naval shipbuilding industry.

Company data in the List of Organisations from 2015 is limited to the full name of each entity and the city where the main office is registered. All entities are sorted according to the organisational form of their business, their defence industrial branch affiliation, and the supervising state organ. More than 70 per cent of all entities are subordinated to the Ministry of Industry and Trade.

The total number of entities enclosed in the Consolidated Register as manifested in the List appears to be relatively stable. In July 2015, the List comprised 1353 organisations, and reflected the then recently completed incorporation of the thirteen—still *de jure* Ukrainian—defence companies in Russian-occupied Crimea.[7] By April 2018, two additional entities had been added to the Register, according to other sources.[8] However, by July 2020, the total figure for the number of defence industrial organisations appeared to have shrunk to 1281.[9] Yet, this contraction seems not to have had any real impact on the number of employees within the defence industrial sector. Both in April 2018 and in July 2020, the Government

[5] Pravitelstva Rossiiskoi Federatsii 2004b.

[6] Ministerstvo promyshlennosti i torgovli Rossiiskoi Federatsii 2015.

[7] Ibid.

[8] Pravitelstvo Rossiiskoi Federatsii 2018a.

[9] Ministerstvo promyshlennosti i torgovli Rossiiskoi Federatsii 202?.

reported that 'about two million people' were employed in the defence industry. Most of the recent contraction of the Register is therefore probably more due to renewed efforts at sectoral reorganisation than company closures, corporate bankruptcies, or any other plausible reasons for exclusions from the Register. Unfortunately, as no new List of Organisations has been released since 2015, it is neither possible to confirm nor reject this assumption.

The USRLE database

As an addition to the rudimentary data that the List of Organisations provides, some Russian open access databases have been used as complementary material. A good starting point has been the Federal Tax Service of Russia,[10] which keeps records of all legal entities and individual entrepreneurs through the Unified State Register of Legal Entities (USRLE) and the Unified State Register of Individual Entrepreneurs (USRIE).[11] The USRLE register contains basic data on all entities, such as full company name and address, proof of state registration, their actual state, legal representative, share capital, founders, taxpayer identification number (TIN),[12] and the types of economic activities each entity is involved in. Where applicable, the register might also contain information about any branches and representative offices, or pending restructurings, and other entries of legal significance that have been added to it.

The accredited databases of disclosed financial information

Even more profound company information can be found in certain accredited databases, which are in the public domain.

By law, Russian companies are subject to mandatory disclosure of certain financial and company data on Russia's securities market. Composition, procedure and terms of mandatory disclosure of data are standardised according to Regulation number 454-P of the Central Bank of Russia. Compliance with the rulings of this regulation is, by default, compulsory for all issuers of securities who fall under Russian jurisdiction.[13] In particular, articles 69 to 75 establish the information that public and non-public joint-stock companies are obliged to disclose. Some examples are the charter and other internal management documents; company annual reports and annual financial statements, together with the auditor's report; and information about affiliated legal and natural persons. In addition, public joint-stock companies are also required to divulge their quarterly reports as well as any other

[10] In Russian: *Federalnaia nalogovaia sluzhba*.

[11] In Russian: *Edinyi gosudarstvennyi reestr iuridicheskikh lits (EGRIuL)* and *Edinyi gosudarstvennyi reestr individualnykh predprinimatelei (EGRIP).* Website: https://egrul.nalog.ru/index.html.

[12] In Russian: *Identifikatsionnyi nomer nalogoplatelshchika*, *INN*.

[13] Tsentralnyi Bank Rossiiskoi Federatsii 2014, article 1.1.

material facts that might cause a significant impact on the value of the company's shares or any other securities it issues.

The Central Bank has accredited five news agencies through which entities affected by Regulation 454-P can disclose the required information. The most important of these agencies is a subsidiary to *Interfax*, the limited liability company *Interfax Tsentr Raskrytiia*, which handles 70 per cent of all disclosed information.[14] The remaining 30 per cent is more or less evenly distributed between three of the other four agencies,[15] along with the fourth, *Assotsiatsiia zashchity informatsionnykh prav investorov*, whose share is about half the size of those of the other three.

For the purpose of this study, the accredited databases of *Interfax Tsentr Raskrytiia*, *ZAO Analiz, Konsultatsii i Marketing*, and, to a lesser extent, *AO Agentstvo ekonomicheskoi informatsii PRAIM*, have been consulted to sort out ownership relations and, in some cases, company production.[16] In this work, especially the TIN number turned out to be extremely useful in searching for specific companies in the registers. Most company data are from 2016 or later.

List-Org

A third entry into basic Russian company data that has been used in this study is the database *List-Org*[17]. Basic data in the List-Org has been extracted from the USRLE database and the accredited databases under Regulation 454-P. However, List-Org adds some other useful information, such as arbitration cases and GPS coordinates for company head offices. It also provides some useful functions, such as an interactive map localisation of a company, or a likewise interactive graphical representation of the structure of natural and legal persons with whom the company is associated.

Unfortunately, it has not been possible to establish which organisation is behind List-Org. Comparisons with the other databases nevertheless demonstrates that most of the data from List-Org is reliable and accurate. However, as for the GPS information, it has been necessary to use other sources, such as Google Earth, company addresses and street view pictures in order to verify the true location of each company in the study.

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[14] Interfaks Tsentr Raskrytiia 2018.

[15] These are *Avtonomnaia nekommercheskaia organizatsiia Assotsiatsiia zashchity informatsionnykh prav investorov*, *AO Agentstvo ekonomicheskoi informatsii PRAIM*, *AO Sistema kompleksnogo raskrytiia informatsii i novostei*, and *ZAO Analiz, Konsultatsii i Marketing*.

[16] *Interfaks Tsentr Raskrytiia* (www.e-disclosure.ru*)*, *ZAO Analiz*, *Konsultatsii i Marketing* (http://www.disclosure.ru/index.shtml) and *AO Agentstvo ekonomicheskoi informatsii PRAIM* (www.disclosure.1prime.ru).

[17] Website: www.list-org.com.

Company webbsites

Russian company websites are of varying quality but have also been consulted to add context to the data from the above-mentioned sources. Company websites are also often an access point to obtaining a better understanding of specific data about the main production or business activities of a particular company. Some companies, however, appear to disguise the fact that they are primarily working with defence production, as they only promote their civilian production.

1.3 Outline

The rest of this study is organised according to the following. *Chapter 2* outlines the origins of the Russian shipbuilding industry and the tensions between Russia's naval ambitions and the fact that Russia is ultimately a land power. *Chapter 3* assesses Russia's shipbuilding competitiveness and its current market prospects for commercial and naval shipbuilding. *Chapter 4* looks into the comprehensive structure of Russia's shipbuilding industry and, in particular, its naval subset. *Chapter 5* analyses the structure of the companies and company groups that are involved in Russia's naval shipbuilding. *Chapter 6* presents the author's conclusions from the study.

1.4 Further Studies

This report is an additional building block in a series of studies of the current state and prospects of the different branches of the Russian defence industry and of other industries of great importance for Russian armament. The first report in this series discussed the Russian machine tool industry.[18] It was published in February 2019.

The main idea is to apply the same methodological framework to all the studies, building each case study on common and generally accepted theories of industrial organisation. Although it is likely—even desirable—that each study will become *sui generis* in its own right, it is also likely that given the specific character of each industry and the available information, the common methodological approach will facilitate further cross-industry comparisons between different Russian defence-related industries, as well as intra-industry comparisons with analogous industries in other countries.

[18] Malmlöf 2019.

2 The emergence of a Russian shipbuilding industry

Russian naval shipbuilding dates to the 29th of June 1667, when Czar Aleksei Mikhailovich Tishaishii—the second czar in the Romanov dynasty—issued a decree on the construction of the frigate *Orel*. This was the first Russian-built warship based on Western European principles, and it was commissioned to protect Russian trading ships in the Caspian Sea. Unfortunately, its service life was unexpectedly short—in 1670, peasants and Cossacks in revolt under the leadership of Stenka Razin captured and burned it. Nevertheless, the *Orel* has achieved lasting importance as a legendary symbol of the genesis of Russian sea power.

2.1 The tsarist legacy of Russian naval traditions and shipbuilding

In a figurative sense, the fate and symbolism of the frigate *Orel* reflect the vicissitudes of Russia's naval tradition, its commercial fleet, and its shipbuilding industry during the subsequent centuries and up to the present day. Throughout the history of Russia, its leaders have been torn between their ambitions to project the image of Russia as a great naval power and the reality of economic constraints and the fact that Russia is ultimately a land power.

For instance, the Soviet admiral and naval theorist Sergei Gorshkov has ascribed Russia's loss of influence and general decline in the 19th century to the failure of Czarism to grasp the importance of the fleet in Russia's development.[19] Granted, Emperor Alexander III (1845–94) might have been an exception, as he had a better understanding of the naval instrument than his predecessors did.[20] Despite the attention the Russian Imperial Navy received under the reign of Alexander III, it was not sufficient, however, to prevent the forthcoming defeat in the Russo-Japanese war of 1904–05.

Nor was tsarist Russia among the leading shipbuilding nations at the turn of the 20th century. In particular, the government had no policies or programmes in place to stimulate domestic shipbuilding. Simultaneously, Russia's annual output of naval engineers at the time did not exceed 15 graduates.[21]

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[19] Gorshkov 1983 passim.

[20] It is in this context that Alexander III's famous expression of Russia's true allies should be understood: 'In the whole world we have only two faithful allies, our army and navy. All other, at the earliest opportunity, will gang themselves up against us'. ('*Vo vsem svete u nas tolko dva vernykh soiuznika, nasha armiia i flot. Vse ostalnye, pri pervoi vozmozhnosti, sami opolchatsia protiv nas*'.)

[21] Alekseev 1985:2.

The aftermath of the Russo-Japanese war led to a comprehensive overview and reconsideration of the entire system and the way the Russian empire fought a naval war.[22] However, efforts to modernise and expand the fleet began too late to have any real impact on Russian warfare in World War I, other than being detrimental to the modernisation of the army.[23]

2.2 Soviet commercial and naval shipbuilding in the inter-war period

Substantial changes to Russian maritime and naval strategies took place in the early years of Soviet power. In March 1921, the Council of People's Commissars (*Sovnarkom*) defined, for the first time, how the shipbuilding industry should be organised and developed. In November 1924, the Council of Labour and Defence ordered the construction of the first Soviet-made vessels. It was not coincidental that all the vessels were different kinds of transport ships: the Soviet Union needed foreign currency to purchase machinery. It therefore focused on building ships suitable for transporting exports of bulk commodities, such as wood, oil, meat and dairy products. On the verge of World War II, the Soviet maritime transport fleet comprised about 700 ships, with an overall tonnage four times greater than that of the Russian fleet in 2014. The fishing fleet consisted of more than 6000 vessels, and the river fleet of some 2700 vessels.[24]

In contrast, Soviet naval shipbuilding can only be traced back to December 1926, when the Council of People's Commissars approved a six-year programme to build submarines, frigates and torpedo boats, as well as to repair and complete work being carried out on existing ships.[25] At some point in the mid-1930s, Joseph Stalin interfered more actively in Soviet naval affairs and insisted upon a powerful high-seas navy built around modern battleships. In terms of shipbuilding, this policy disrupted the progress of the Second Five-Year Plan, with an even more ambitious shipbuilding programme.[26]

Analogous to the pre-World War I quest for a blue-water navy—that is, a navy capable of operating across the deep waters of open oceans—Stalin's decision had a negative impact on the development of the army. Nor did it improve the geopolitical situation of the Soviet Union, as no major new ships could be completed in time before the outbreak of the next world war. Nevertheless, under the pre-war

[22] Demchak 2016:69.

[23] CAST 2015:25.

[24] Alekseev 1985:2–3.

[25] Alekseev 1985:25.

[26] Demchak 2016:348–349.

five-year plans up to 1942, the Soviet fleet received 312 ships, including 4 cruisers; 37 flotilla leaders and destroyers; and 206 submarines. During the war, in addition to repairing damaged ships, the industry managed to build more than 1100 naval vessels.[27] Yet, none of these was crucial to Soviet warfare; in a repetition of the previous war, the fleet again came to play a purely secondary, auxiliary role in the Soviet military campaigns.

2.3 Soviet shipbuilding in the first post-war decade

In the first post-war decade, global naval shipbuilding almost ended. Naval forces were scaled back because of peace; there was a global surplus of naval ships; and, due to warfare, the shipbuilding industry was badly damaged in most places, except in the United States and Scotland.

Soviet Admiral Gorshkov has also pointed out that the appearance of nuclear weapons in the last days of the war was a cause of the decline in naval shipbuilding.[28] Their appearance necessitated a wider discussion in military circles on the influence of nuclear weapons on the character of armed struggle on land and sea and in the air. Concerning naval warfare, the future role—if any—of naval fleets under conditions of nuclear war had to be assessed, as did the required adaptations of the tactical qualities of naval ships regarding, for instance, such aspects as their construction, arming and viability.

2.4 Soviet shipbuilding during the Cold War

In parallel with the development in Western countries, the emerging Soviet-led eastern bloc of socialist countries rebuilt their shipbuilding capacity in earnest during the 1950s. The division of work was such that Poland and East Germany primarily focused on commercial shipbuilding and the Soviet Union on naval vessels. An exception to this rule was that the Soviet Union also built certain more advanced civilian vessels.

In the Soviet Union, the authorities directed the construction of the largest ships to Ukrainian shipyards. Most of these ships were only used within the eastern bloc. Although some of them made it to the secondary market, they were often poorly built and were not cost-competitive. During the following decades, shipbuilding within the Soviet-led bloc of countries had little impact on the development of the

[27] Alekseev 1985:3; CAST 2015:25.

[28] Gorshkov 1983:1, 56.

global shipbuilding market. Typically, the Eastern European and Soviet shipbuilding followed its own trajectory or reacted to global trends set by other shipbuilding nations.[29]

During the 1970s and -80s, civilian shipyards within the Soviet-led bloc saw significant growth. The cause behind this development was the decision by Soviet leaders to build a Soviet merchant marine to trade worldwide, in order to reduce the cost of imports and generate hard currency from export. However, trade did not expand as fast as the Soviet merchant marine was built, which led to surplus shipbuilding capacity within the Soviet-led bloc.[30]

A post-war landmark for Soviet civilian shipbuilding was otherwise the construction of the icebreaker *Lenin*, which entered operation in 1959. The *Lenin* was simultaneously the world's first nuclear-powered surface ship and the first nuclear-powered civilian vessel. In 1977–1992, five Project 10520 *Arktika*-class icebreakers followed suit. Other milestones in the 1970s were the completion of the communications ship *Kosmonavt Iurii Gagarin*, Project 1909, and the fishery-depot ship *Vostok*. Production of domestic marine drilling platforms began in 1975, following the development of offshore drilling.[31] From 1975 to 1996, the Zaliv Shipbuilding Yard in Kerch, Soviet Ukraine, built six Project 1511 tanker ships with a displacement of 180,000 tonnes and a deadweight of 150,500 tonnes—the largest ships ever constructed on Soviet territory. Despite these Soviet achievements in civilian shipbuilding, the principal division of work regarding civilian and naval shipbuilding within the Eastern Bloc remained more or less intact well into the early 1990s.[32]

When the Soviet Union entered the Atomic Age, it abandoned its post-war naval concept of a coastal action fleet capable of conducting operations only within the framework of attaining the goals of major front operations based on World War II experience.[33] From the mid-1950s, the Soviet Union began to build a nuclear missile fleet based on fewer but larger surface ships suited for the high seas and nuclear-powered submarines. This neoteric naval direction was formed under the political leadership of Nikita Khrushchev and followed within the Soviet Navy under the watch of Admiral Gorshkov. Succeeding Soviet leaders did not find any reason to alter this direction.[34]

By the end of the 1980s, the Soviet shipbuilding industry had grown into one of the most prolific in the world. Annual military procurement amounted to some

[29] Colton & Huntzinger 2002:7.

[30] Colton & Huntzinger 2002:17.

[31] Efimova & Sutyrin 2019:4.

[32] Remizov 2013:3.

[33] Gorshkov 1983:179.

[34] CAST 2015:25.

50 units of submarines, battleships, and auxiliary vessels. In the civilian segment, the Soviet Union was ranked among the ten most developed countries. The Soviet shipbuilding industry had a capacity to build transport vessels with a deadweight up to 550,000 tonnes and fishing vessels powered by 100,000 kW engines.[35]

2.5 The Soviet legacy

Shipbuilding development in the 1970s and 1980s has been formative for the present-day Russian shipbuilding industry in terms of localisation, production capacity and technology. Of great long-term importance was the fact that Soviet and Russian shipbuilding overlooked three crucial revolutions in shipbuilding technology that the global industry underwent from the 1970s onwards.

First, in 1970–77, Japan led the development towards the modular hull-block construction method, with building blocks of 500 to 800 tonnes and the use of heavy cranes. This method replaced the slower traditional construction method of building from the keel upwards. Next, the emergence of the first real-time 3D graphic processing units, GPUs, in 1994–96 allowed ship constructors to take the step from flat design to complete digital 3D modelling. During this period, France, Great Britain, and the United States distinguished themselves as leading producers of industrial shipbuilding software. Finally, in the early 2000s, the technological development allowed full outfitting and piping design, with pipelines and cable routes prepared for final assembly of entire ship blocks. This meant that the construction of ships could switch to assembling large blocks of 2000 to 3000 tonnes, as well as half-hulls weighing up to 10,000 tonnes. South Korean and Chinese shipyards were the first to take up this technology.[36]

Most of the shipyards that accrued to Russia in 1991 were small- to middle-sized, as Soviet division of work had stationed the construction of large ships on Ukrainian territory. Russian shipyards are characterised by covered berths and inclined slipways, with slips and crane equipment up to 100 tonnes. Typically, the design of a particular shipyard lacks a clearly defined, planned architecture but is chaotic in terms of buildings and structures. Comprehensive modernisation has yet to occur; until the early 2010s, only hull-preparation production facilities at a number of enterprises had undergone limited modernisation, leaving imbalances towards other production processes. If these imbalances remain, there will be no significant increases in efficiency in the entire ship construction cycle. The shipyards are therefore plagued by long lead times and high production costs.[37] Another lasting idiosyncrasy from Soviet shipbuilding is the standard size of steel sheets for hull

[35] Pravitelstvo Rossiiskoi Federatsii 2012:11.

[36] Remizov 2013:6–7.

[37] Ibid.

construction. With the dimension 8x2 m instead of the more widely used dimension 12x14 m, the number of welds for hull construction in Russian shipbuilding almost doubles and the workload increases by some 50–60 per cent compared to international practice.[38]

Russian shipyards had already lost competitiveness in the civilian sector in the 1980s. In naval shipbuilding, the consequences of Russian backwardness became obvious even in the 2010s.[39]

2.6 Development under President Putin

Given the close relationship between Russia's naval forces and the shipbuilding industry, when Russia's political leadership once again increased its commitment to the Naval Forces during the earlier days of the rule of President Vladimir Putin, it also had to take on long overdue and essential structural reforms of the shipbuilding industry.[40] Yet the first ten years of Putin's rule saw little of these reforms; during this period, the lion's share of budget allocations for naval shipbuilding was assigned to development of the Borei-class[41] submarines and the new submarine-launched ballistic missile (SLBM), *R-30 Bulava*[42].

A more determined economic commitment to the entire shipbuilding industry was on hold until the introduction of the State Armament Programme 2011–2020 (GPV-2020). This was the fourth framework programme of its kind for arms procurement since the establishment of the Russian Federation, and it was financially much more ambitious than any of the preceding programmes had been. It also allocated 25 per cent, or 5.0 trillion roubles, of the entire programme funding to naval shipbuilding, compared to 15 per cent for equipment to the Ground Forces.[43] It is hard to overestimate the significance of the GPV-2020 to the shipbuilding industry in the mid-2010s, as naval equipment then accounted for 70 per cent of all orders, including 21 per cent for export.[44]

Early on during the programme implementation, it nevertheless became clear that the production targets and geopolitical ambitions as reflected in the fourth Armament Programme did not correspond to the production capacity and capability of its shipyards to produce the required ships and submarines for the Navy. The industry was neither equipped nor organised to absorb funds effectively, after more

[38] Remizov 2013:20.

[39] Remizov 2013:6.

[40] Tsypkin 2010:332.

[41] Project 955, also referred to as Dolgorukiy-class, is Russia's newest ballistic missile submarine, SSBN.

[42] NATO reporting name SS-NX-30 or SS-N-32.

[43] CAST 2015:23.

[44] Aleksandrov2016

than twenty years of idleness. While the naval part of the industry managed to cope more or less reasonably with the modernisation and overhaul of existing naval ships and vessels, development and ship construction based on neoteric project designs and technological solutions were hampered by bottlenecks throughout the whole production chain, causing serious delays to officially communicated delivery schedules.

At the outset of the programme, the Russian shipbuilding industry was required to deliver 24 submarines and 54 surface naval ships in the main categories by 2020. In order to handle this task, the shipbuilding industry needed to modernise their industrial parks in parallel. However, as of January 2018, the industry had only succeeded in building 10 submarines and 16 surface naval ships, with a total displacement of some 127,000 tonnes. The completion of several projects had to be transferred to the successive fifth armament programme, which was launched in 2018 with a planning horizon up to 2027 (GPV-2027). In comparison, China managed to build 37 analogous naval ships, with a combined displacement of almost 240,000 tonnes, and the United States, 24 ship units with a displacement over 370,000 tonnes, in the same period.[45] However, as Russian naval shipbuilding was focused on the construction of several major lead ships for a new generation of surface ships and submarines, it is likely that lead times will shrink for all consecutive ships in a series when these shipbuilding programmes will be completed in 2022–2025, according to plan.

Based on its accomplishments and setbacks under the GPV-2020, the appearance that Russian naval shipbuilding has in the early 2020s is ambiguous. On one hand, production delays, low or even negative net profit margins, accumulations of debt, persistent work qualification mismatches, exhaustion of the inherited scientific reserve, unresolved shortages of construction and launch facilities for mass production of large-tonnage ships, and import dependencies downgrade the achievements of the industry in the 2010s and disparage its general performance.[46]

Revenues from the sale of goods, works and services of organisations of the shipbuilding industry, on the other hand, have had a positive trend. In 2018, revenues increased 1.7 times compared to 2012 and amounted to more than 710 billion roubles, of which more than 550 billion roubles were related to industrial entities.[47] Although the industry remains behind the initial naval ship production schedules, it has nevertheless delivered several lead ships for the Russian surface fleet. This will facilitate the construction of the succeeding ships in each series in the 2020s, provided that procurement plans are not changed. As for the submarine fleet, it demonstrates a similar pattern. Three strategic Borei-class submarines were deliv-

[45] Shepovalenko 2018:10.

[46] Pravitelstvo Rossiiskoi Federatsii 2019:3–10.

[47] Pravitelstvo Rossiiskoi Federatsii 2019:3.

ered in 2013–2014, one Yasen-class cruise missile submarine in 2013 and six Varshavyanka-class diesel-electric submarines in 2014–2016. Finally, under the GPV-2020, the industry has also delivered many auxiliary ships and support vessels of different sizes, as well as one naval icebreaker—the first to be built for Russia's Naval Forces in nearly 40 years.

As for development trends beyond 2025, it looks as if the issue of Russia's upcoming fleet architecture for the 2020s to the 2050s has not been entirely settled yet. As for the operational-strategic tasks, and the role of the Naval Forces in Russian defence, the currently appearing picture demonstrates a more balanced fleet, armed with high-precision weapons not only for maritime use but also for land targets.[48] Russia's naval nuclear strategic deterrence remains a central task, but there is a new focus on conventional deterrence, based on cruise missiles.[49]

Shrinking financing for naval shipbuilding in the GPV-2027 might signal that Russia's decision-makers are inclined to think that a powerful navy, able to sail the open seas for extended periods, that is, a blue-water navy, is beyond Russia's reach or its current needs.

However, the large-scale structural reforms that the naval part of the shipbuilding industry has been subjected to since the late 2000s might reflect having greater ambitions than a decent coastal—or green-water—navy. The outcome of these reforms so far has been, among other things, that company groups are more functional and therefore more effective, which enables them to better comply with current requirements for modern shipbuilding, and to take on construction of larger ships and vessels. Although it should not be ruled out that further reforms are yet to come, it is nevertheless probable that the industry at large now has its structure in place for the foreseeable future.

[48] Kjellén 2021:40–41.

[49] The author wishes to thank Mr Jonas Kjellén, FOI, for this valuable comment.

3 Market demand for Russian shipbuilding

The importance of shipbuilding to Russia, and its demand for ships and vessels, is primarily due to its geography: Russia is in possession of almost 40,000 kilometres of maritime borders and 100,000 kilometres of inland waterways. Consequently, on one hand, there is a great potential demand for all kinds of ships. On the other, the Soviet legacy makes itself visible in the fact that contemporary Russian shipbuilding still focuses on the construction of naval vessels. In 2010–2012, for instance, 44 per cent of the shipbuilding production volume was financed under the State Armament Programme. Revenues from naval export made up another 21 per cent. Civilian shipbuilding for the domestic and export markets financed 20 per cent and 4 per cent, respectively.[50] In 2013–2018, naval production accounted for up to 90 per cent of sectoral output, according to the Ministry of Industry and Trade.[51]

3.1 Domestic naval ship demand

Since 2012, Russia's domestic demand for naval shipbuilding has been managed through the long-term State Shipbuilding Programme up to 2050, the overlapping ten-year State Armament Programmes and the yearly State Defence Orders that regulate actual procurements for the current year or, in some cases, for the next few years. Due to the secrecy that surrounds these documents, nothing is known about their original content apart from the information that has been publicly released. It is also not known to what extent they are subject to major reviews and updates to reflect changing circumstances and priorities. Other official acts of interest in this regard are the Maritime Doctrine (2015) and the Fundamentals of State Policy in the Field of Naval Activities (2017), as well as the Strategy for the Development of Maritime Activities (2010). To a lesser extent, domestic demand also mirrors the evolution of Russia's military-technical cooperation with other states.[52] A timeline for the known programmes and doctrines of importance to Russia's shipbuilding industry is shown in Figure 3.1.

The direction of Russian naval shipbuilding under the previous State Armament Programme 2011–2020 and up to 2020 was aimed at nuclear-powered and conventional submarines; corvettes and frigates, patrol and guard ships, landing ships, missile ships, and minesweepers; and different special-purpose vessels. Several of the lead ships from different surface and submarine ship projects laid down under

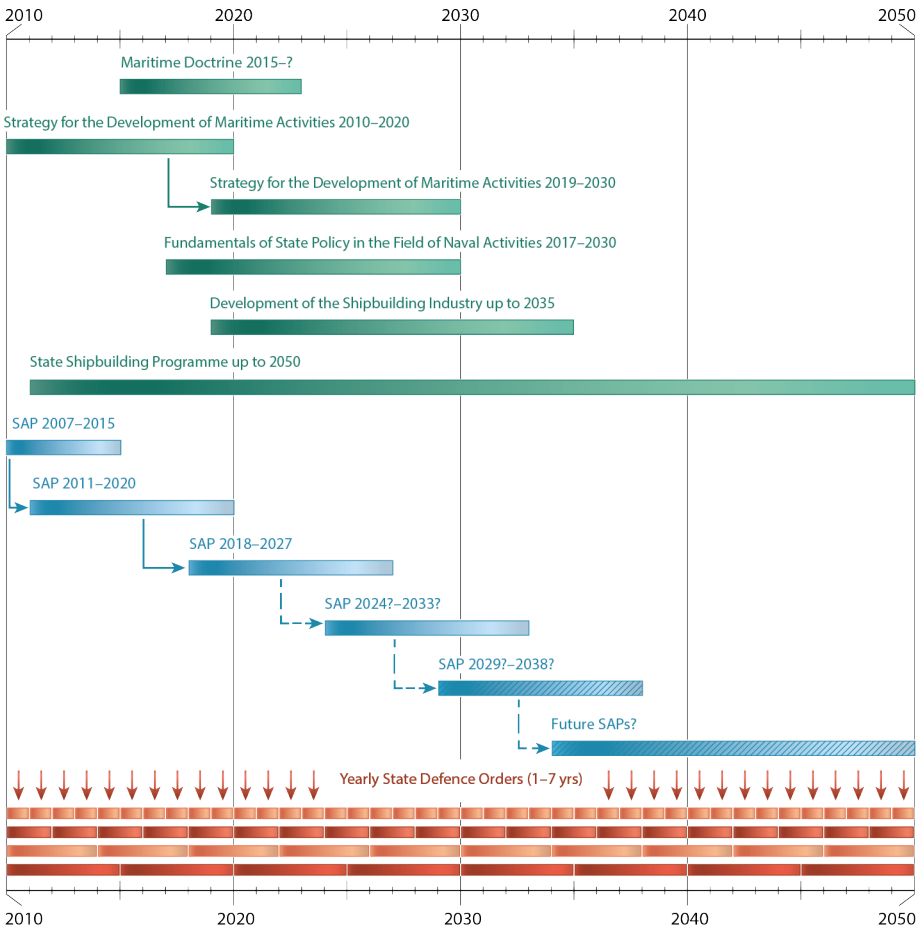
[50] Remizov 2013:17–18.

[51] Ministerstvo promyshlennosti i torgovli Rossiiskoi Federatsii 2018:20.

[52] Ibid.

the State Armament Programme 2011–2020, or earlier, were brought to completion only in the late 2010s or early 2020s, causing significant delays to the originally declared procurement plans. Russia's decision-makers therefore intend to complete the serial production of the remaining ships in these projects in 2022–2025.[53]

Figure 3.1: Timeline for some central doctrines, strategies and programmes that have an impact on the Russian shipbuilding industry.



Remarks: SAP—State Armament Programme. The yearly State Defence Orders might vary depending on which system is ordered, i.e., some systems must be delivered the same year as they are ordered, whilst other systems are ordered several years in advance to facilitate the industry's production planning.

[53] Ministerstvo promyshlennosti i torgovli Rossiiskoi Federatsii 2018:20–21.

Regardless of the delays, these activities appear to be more or less compatible with the broad outline that the previous Commander-in-Chief of the Russian Navy, Admiral Viktor Chirkov, made of the 2050 Shipbuilding Programme back in 2012.[54] In addition, Russia's decision-makers have yet to give permission to proceed on the development and construction of both a new aircraft carrier and a destroyer, which Russian Naval decision-makers and planners held in prospect when the State Armament Programme 2011–2020 was launched.

Following Admiral Chirkov's outline of the 2050 shipbuilding programme, the period 2021–2030 would constitute the second stage of the programme. Presuming that the 2050 programme has not lost its status as a guideline to Russia's naval fleet development and that it has not been amended beyond recognition, Russia will continue to strengthen its naval capacity throughout the 2020s. According to Admiral Chirkov, shipbuilding activities would at this stage focus on building strategic non-nuclear deterrence groups and rapid reaction groups with blue-water capability.[55] Such a direction implies even more strongly that in the next decade Russia would need to start building larger surface ships with longer endurance and higher seaworthiness than today's frigates. In 2012, Admiral Chirkov anticipated that the construction of a new generation of destroyers as well as serially produced aircraft carriers and amphibious assault ships would take place throughout the 2020s in parallel with the construction and serial production of a new fifth generation nuclear-powered attack submarine. In parallel, Russia would also start developing a new generation of modular multipurpose ships of different classes as well as building the lead ships for these classes during this period.

Although these ambitions are frequently referred to by Russian decision-makers and discussed in the media, as of spring 2021, most of them appear to remain at a conceptual stage—at best. Regarding Russian shipyard production capacity, technical constraints, and the limitations of the Russian defence budget, as well as the need for a balanced development of all branches of service, it therefore seems doubtful that they will be implemented in the next decade or two.

At the same time, there is no indication that Russia's decision-makers have entirely abandoned the original 2050 programme. On 20 July 2020, six new warships were laid down at different shipyards. Among them were two Project 23900 amphibious assault ships, the *Ivan Rogov* and *Mitrofan Moskalenko*, which were laid down at the Zalyv Shipbuilding Yard, in Kerch, in Russian-occupied Crimea. According to the construction schedule, they were to be delivered in 2025 and 2027, respectively.[56] Other sources state that delivery of the first ship will take place in 2028.[57] For Russia, these are the first ships of their kind, and they are intended to replace

[54] Chirkov 2013.

[55] Chirkov 2013.

[56] *Tass* 2020.

[57] Kretsul and Lavrov 2021.

the Mistral ships that France declined to deliver due to Russia's war against Ukraine. Neither the Fundamentals of State Policy in the Field of Naval Activities to 2030 nor the Strategy for the Development of Maritime Activities to 2030—adopted in that order as late as in July 2017 and in August 2019—indicate any deviation from Russia's previously communicated naval ambitions.[58] Although naval and defence experts within Russia have questioned current Russian naval policies, obviously the intention of the Russian government is to continue to provide the naval shipyards with new ship construction work at least throughout the 2020s—all other things being equal.[59]

3.2 Foreign demand for Russian-built naval ships

Due to the general security dimension that surrounds all naval shipbuilding, it has mainly stayed in the hands of countries that traditionally keep large naval fleets. This is contrary to commercial shipbuilding, for which there is no strong correlation between domestic shipbuilding and the size of one's own commercial fleet.

A consequence of this dissimilarity is that export opportunities for naval ships are very limited with equal respect to ship type and potential export volumes. For the most part, importing countries are not looking for cutting-edge weapon systems. Nor do they have any typical interest in a blue-water navy capable of sailing the oceans of the world, but are interested in one that can defend their green-water areas, i.e. coastal or regional defence. Insofar as a naval export market does exist, it is therefore largely a market for modestly priced frigates and small conventionally powered attack submarines. Most of the money in military ship export business is in vessels under 5000 tonnes (approx. frigates), of which the majority are ships below 3000 tonnes (approx. large corvette or small frigate).[60]

Germany, France and Russia dominate global exports of naval surface ships and submarines, with a combined market share of more than 80 per cent. They are followed by Spain and the Netherlands. Neither the United States nor the UK is a major exporter of naval ships, even though both have formidable naval shipbuilding industries. The reason is that the U.S. and U.K. naval shipyards are focused on larger ships, for which there are minimum export opportunities.[61] An exception to the rule is US export of decommissioned destroyers to its closest allies and partner countries, which has had some success.

The Strategy for the Development of the Shipbuilding Industry for the Period up to 2035, which was approved by the Russian government as late as October 2019,

[58] Prezident Rossiiskoi Federatsii 2017; Pravitelstvo Rossiiskoi Federatsii 2018b.

[59] *Bmpd.livejournal.com* 2017.

[60] Birkler *et al*., 2005:80–81.

[61] Birkler *et al*., 2005:74–82.

elaborates on Russia's current view of its prospects for naval export.[62] The starting point, according to the Strategy, is that contemporary Russia is one of a handful of countries able to offer almost the entire range of weapons and special equipment for all branches of service. In particular, the production and technological capabilities of the Russian shipbuilding industry ensure its ability to provide a wide selection of naval ships and vessels for export, including submarines; patrol ships; corvettes; missile, landing, and patrol boats; and coastal and inshore mine sweepers.[63]

According to the Strategy, Russia's competitiveness is strongest with regard to construction of conventional submarines. For the next decade—the 2020s—the Strategy estimates global early demand for conventional submarines at some 60–70 units. This assessment also encompasses small and midget submarines and manned deep-sea vehicles. Theoretically, Russia's shipbuilding capacity allows it to satisfy up to 30 per cent of this demand. Whatever the case for Russia's exact share in this future submarket, a global increase in the number of submarines in keeping with this prognosis likewise entails a strengthened market for countermeasures against submarine warfare, such as anti-submarine ships, stationary and ship sonar systems and complexes, and anti-submarine weapons.[64] This would open up other market opportunities for the Russian shipbuilding industry as well as for other parts of its defence industrial complex.

However, the draft version of the Strategy, which was drawn up by the Ministry of Industry and Trade in 2018, acknowledges that Russia's naval export potential is not without trials.[65] Military-technical cooperation in the field of naval technology is particularly fraught with serious challenges. Russia's main partners in this field—China, India and Vietnam—aim to ensure the construction of powerful navies independently of Russia. These countries also actively enter the arms market and compete directly with the Russian arms industry. Large importing customers of submarines—India, China and Indonesia among others—prefer to limit their orders to one or two submarines in a series and subsequently produce the remaining vessels in their own shipyards.

3.3 Civilian ship market—domestic demand

Russia's domestic civilian ship market consists of several different submarkets. Each of them is made up of one or a few types of ships, of which some, such as icebreakers, might be considered as dual-use products under certain circumstances. The main submarkets are the marine and oceanic transport fleet; the river and

[62] Pravitelstvo Rossiiskoi Federatsii 2019.

[63] Pravitelstvo Rossiiskoi Federatsii 2019:11.

[64] Ibid.

[65] Ministerstvo promyshlennosti i torgovli Rossiiskoi Federatsii 2018:32–33.

mixed river-sea cargo fleet; the fishing fleet; ships and equipment for the development of the continental shelf; and the Arctic fleet.[66]

The marine and oceanic transport fleet

About 60 per cent of Russian foreign trade cargo turnover is carried out with the participation of its merchant fleet, consisting of ships for marine and oceanic transport. Largely, Russia exports liquid and dry bulk such as crude oil and oil products, coal, grain and fertilizer, and imports finished containerised products.

In 2012, the deadweight tonnage of the Russian merchant fleet amounted to 17.5 million tonnes, of which 12.36 were controlled by the state-owned company, *Sovkomflot*, whose fleet amounted to 161 ships. Next in line were *Primorskoe morskoe parokhodstvo* and the *Dalnevostochnoe morskoe parokhodstvo*, with deadweight tonnages of 1.1 and 0.3 million tonnes, distributed among 12 and 26 ships, respectively. Other companies, such as *Murmanskoe morskoe parokhodstvo, Severnoe morskoe parokhodstvo* and *Sakhalinskoe morskoe parokhodstvo* are far behind in size.[67] The high degree of buyer concentration indicates that this market segment is more or less oligopsonistic, with rather strong inclination towards a monopsony market, i.e. few buyers, or only one, related to the number of producers. Although the average ages of the cargo ships in their fleets were among the youngest, *Sovkomflot* and *Primorskoe morskoe parokhodstvo* were among those most actively investing in new ships. As Russian civilian shipyards are usually not equipped to construct larger ships and are generally non-competitive, both companies have so far had their cargo ships built in South Korean shipyards.

The river- and mixed river-sea cargo fleet

The Soviet river- and mixed river-sea cargo fleet was a well-integrated system consisting of about 40 larger shipping companies, with a combined fleet of 30,000 ships and centralised logistic functions. In the Soviet Union, river transport accountted for 20 per cent of cargo transportation. Since this system was broken up, some 1500 entities have surfaced in its place. Of these, only 15–20 companies carry any significant economic weight. Due to this decentralisation and atomisation of the overall structure, the river fleet has lost most of its cargo base. The overall transport volume has shrunk from 600 million tonnes to 100–150 million tonnes on a yearly basis. Parts of this base have been switched to road or rail transport, while other parts have simply gone into oblivion.[68] By 2012, according to a report from the expert council of the Chairman of the Military-Industrial Commission under the Russian Government, the state of the river fleet had decayed into

[66] Remizov 2013:48.

[67] Remizov 2013:48–50.

[68] Remizov 2013:50–52.

critical condition. Up to 90 per cent of the ships were then to be written off within the next ten years, owing to their unsatisfactory technical condition, according to experts.

However, most river-cargo companies are too small and lack the financial funds necessary to invest in new ships. For the entire post-Soviet period up to 2012, only companies related to the Volgo-Balt Transport Holding Company (VBTH) had actually ordered new river ships from Russian shipyards. Still, although the VBTH is controlled by Russian billionaire Vladimir Lisin, through the Universal Cargo Logistics Holding, even these companies needed governmental backing for their investments. In 2012, only three shipyards—VBTH-controlled *Okskaia sudoverf*, *Nevskii sudostroitelno-sudoremontnyi zavod*, and *Krasnoe Sormovo*—were building cargo and transport river ships and ships for combined use on rivers and coastal seas. All three shipyards were working at close to full capacity.[69]

From the early mid-2010s and onwards, the government has adopted several separate programmes to develop the entire transport sector, river and coastal sea transport included. At the turn of 2017, the government embraced a more comprehensive approach, as it merged several single-purpose programmes into a new broad state programme for the development of the transport system.[70] In spite of governmental interference and an immense potential for river transport, the river transport segment will most likely continue to develop slowly. Besides high ship construction costs, low solvency and lack of credits, the lingering physical decline of Russia's interior waterways impedes development. It is therefore not likely that demand for river- and mixed river-sea cargo ships will increase significantly over the next years.[71]

The fishing fleet

The core of the current Russian fishing fleet was built up from the 1960s to the 1980s. In the early 2010s, it had entered a state of moral and technical obsolescence and no longer corresponded to contemporary requirements. This state of affairs was also reflected in Russia's total catch of maritime biological resources, which diminished from seven to four million tonnes between 1991 and 2011. During these years, Russian fishing production volume in the exclusive economic zones of other states and on the open seas of the world ocean decreased by some 65 per cent and 75 per cent, respectively. In 2012, the core of the fishing fleet consisted of 222 large fishing vessels. About 120 of these, most of which were already not in use in 2012, were to be written off by 2015.[72]

[69] Remizov 2013:50–52.

[70] Pravitelstvo Rossiiskoi Federatsii 2018c.

[71] Remizov 2013:50–52.

[72] Remizov 2013:52–53.

Restructuring of the fishing industry admittedly brought in some new and significant capital to the branch in the early 2010s. The fishing industry is a protected industry in Russia, and the authorities therefore also used this opportunity to weed out some unwanted foreign investment capital. These measures, however, did not bring about any real spillover effects on the shipbuilding industry. Big fishing companies gave precedence to deep modernisation of their existing large fishing ships—complete refitting with new navigation and fish-catching equipment—over construction of new fishing vessels. Since hull construction is the main competence of Russian shipyards, and the fishing companies planned to buy fishing and navigation equipment as well as refrigerator compartments from abroad, demand for Russian shipyard services did not really increase within this segment in the 2010s. With few exceptions, at least until the early 2010s, Russia did not build any mid-sized and small fishing vessels.[73]

Ships and equipment for the development of the continental shelf

By the early 2010s, Russia had significantly increased its knowledge in integrated construction of large offshore platforms, including semi-submersible and jack-up drilling rigs, ice-resistant fixed platforms and auxiliary modules. Based on production costs and yearly produced value, Russian production capacity was about half a platform per annum in 2009–2012.[74]

The main buyers in that period were Lukoil, developing fields in the Caspian Sea, and Gazflot (currently Gazprom flot), drilling wells near Sakhalin, as well as some foreign customers—Dragon Oil Turkmenistan and NCG Services Company. Most orders for offshore platforms were placed at companies of the Astrakhan shipbuilding hub in the Caspian Sea region—*SZ Lotos*, *Astrakhanskii korabel, SZ Krasnye barrikady*. As the Caspian Sea is an inland body of water, all offshore platforms must be constructed on its shores. Outside access to the Caspian Sea is only possible by the Volga River, along which such large metal structures as drilling and production platforms simply cannot be physically transported. In this regard, the Caspian Sea basin constitutes an interesting closed market where the Astrakhan shipbuilding companies must compete with comparable shipyards from Azerbaijan, Turkmenistan and Kazakhstan.[75]

According to the State Programme for the Development of the Shipbuilding Industry up to 2020, Russian decision-makers foresaw a serious expansion of the exploitation of the Russian shelf. They therefore planned, accordingly, for an increased production of offshore platforms, as well as of different auxiliary ships for

[73] Remizov 2013:52–53.

[74] Remizov 2013:54–55.

[75] Remizov 2013:54–55.

the offshore industry. However, these plans corresponded neither to the real capacity of the Russian shipbuilding industry, nor to the actual development plans of Russia's hydrocarbon industry. Had these plans been fulfilled, the shipbuilding industry would instead have had problems building the complementary bulk ships of 100–150 thousand tonnes deadweight for transport of hydrocarbon products from the offshore fields in parallel with offshore platforms.[76] Although this area is probably still of great interest to the Russian state, it appears in hindsight that the expansion was duly postponed in the 2010s, probably mostly because of the weakened world demand for hydrocarbons.

The Arctic fleet

A particular trait in Russia's civilian use of the seas is its need to conduct economic activities on the Arctic coasts and high-latitude cold waters. Russian decision-makers envisage three key directions for these activities. The first relates to the extraction of hydrocarbons from the sea shelves of Russia's surrounding Arctic seas. The second regards keeping year-round navigation open in the Baltic and White Seas. The third direction—revival and commercialisation of the Northern Sea Route—is usually the one that attracts most attention, both in Russia and abroad.[77]

The Northern Sea Route is a shipping route that starts east of Novaya Zemlya and runs along the Russian Arctic coast from the Kara Sea along the northern shores of Siberia to the Bering Strait. It makes up the major part of the Northeast Passage, the overall route on the Russian side of the Arctic, between North Cape and the Bering Strait. The Soviet Union started to seriously explore and exploit this sea route in the 1930s. In the 1970s and 1980s, transports along the route intensified; this was associated with the development of the Norilsk Combine, which required year-round transports along the Murmansk-Dudinka route. Expansion was also due to the Soviet scientific and technological achievements of that time, which facilitated sea movements in the Arctic. Among the more remarkable achievements was the construction of an entire nuclear icebreaker fleet, with serial production starting in the second half of the 1970s. During the 1990s and onwards, the need for transports along the Northern Sea Route decreased five times compared to the 1980s. Since the 2010s, interest in the transportation route has once again increased. Russian decision-makers expect that a warmer climate will make the Arctic more accessible for long-distance sea transports between Europe and China, thus increasing the commercial potential of the route.[78]

[76] Remizov 2013:54–55.

[77] Remizov 2013:56.

[78] Remizov 2013:56–59.

Taken together, the three key directions for Russia's civilian use of its surrounding cold waters pushed Russia to start upgrading its Arctic fleet beginning in the early 2010s and onwards. Of the six nuclear icebreakers of Project 10520 *Arktika* class that were built in 1971–2007, two remained in service in 2020. The others were being decommissioned and scrapped or awaiting possible scrapping.

Russia's fleet of nuclear icebreakers also includes two shallow-draught Project 10580 *Taimyr*-class nuclear icebreakers, which were built in Finland in 1985–90 and equipped in the Soviet Union.[79] These ships were designed for ice-breaking operations on Arctic coastal routes. Their shallow draught allows them to operate in the adjacent river waters, where the ice conditions are too severe to allow diesel-electric icebreakers to operate and the waters are not deep enough for the above-mentioned Arktika-class icebreakers.

In addition to its nuclear-powered icebreakers, Russia's fleet of major icebreakers also includes some forty diesel-electric icebreakers of various sizes, according to the compilation made by the US Coast Guard Office of Waterways and Ocean Policy in 2017.[80] At the '5th International Arctic Forum' in Saint Petersburg in April 2019, President Vladimir Putin declared that Russia's Arctic fleet would be comprised of at least thirteen heavy linear icebreakers by 2035, of which nine would be nuclear.[81] Already in 2013, the Baltic Shipyard began construction of the *Arktika*, the lead ship in a series of five atomic icebreakers of the new Project 22220 Arktika-class 60 MW nuclear icebreakers—not to be confused with the Arktika-class icebreakers mentioned above.[82] The *Arktika* was commissioned on 21 October 2020 and, according to the plan, the next two ships, *Sibir* and *Ural*, were to be commissioned in 2021 and in 2022, in that order. The fourth ship—*Iakutiia*—was laid down in May 2020, and the fifth ship—*Chukotka*—was laid down in December the same year. The time schedule for the *Chukotka* sets its delivery to late 2026. If the freight traffic along the Northern Sea Route increases to 110 million tonnes by 2030, in line with the more optimistic Russian forecasts, two more icebreakers of this class might be needed.[83] Since 2012, the Baltic Shipyard has also been building the Project 22600 diesel-electric icebreaker *Viktor Chernomyrdin*. With a propulsion power of 25 MW, it is the largest non-nuclear icebreaker in the world. According to what was known in October 2020, it would be delivered to Rosmorport in November 2020.[84]

[79] Rosatomflot 2020.

[80] United States Coast Guard 2017.

[81] Putin 2019.

[82] Also known through the Russian type series designation LK-60Ia, where the number signifies the propulsion power in megawatts, MW.

[83] Vedeneeva 2020a; Pashkov 2020.

[84] Lvova 2020.

Otherwise, Russia's most spectacular icebreaker project so far is the Project 10510 *Lider*-class nuclear icebreaker. Its series designation, LK-120Ia, indicates a projected propulsion power of 110–120 MW, according to different sources. Construction of the first ship, the *Rossiia*, in a planned series of three, began in June 2020, with preliminary delivery no later than in 2027.[85] All three ships will be built at the *Zvezda Shipbuilding Complex*, or SC *Zvezda*. This is in stark contrast to all previous nuclear icebreakers, which were built either by the *Admiralteiskie verfi* or by the *Baltiiskii zavod*. The only exception is the two Project 10580 *Taimyr*-class icebreakers, which were built by the Wärtsilä Marine shipyard in Helsinki.

In short, it appears that the SC *Zvezda*, along with the Baltic Shipyard, is set to play a key role in Russia's renewal of its civilian Arctic fleet, and, possibly, its Arctic naval capability. The SC *Zvezda* is in itself a clear signal about the significance that Russia accords to its Arctic waters and the Northern Sea Route.

3.4 Foreign demand for Russian civilian ships

In Soviet times, most of the large domestic shipbuilding design bureaus were focused on military shipbuilding. This had a negative impact on the Soviet civilian design school, which fell behind the technological development in leading shipbuilding countries. As of the early 2010s, most Russian civilian ships were built on foreign designs, since Russian project designs were still inferior in terms of economic efficiency. For instance, in the segment of river vessels and mixed navigation vessels, the cargo capacity of foreign projects could be up to one and a half times larger than the cargo capacity of domestically developed vessels with practically equal dimensions and metal intensity. Some other examples of factors that devalue the competitiveness of Russian civilian shipbuilding are its dependence on foreign-made electronic ship equipment, lack of stability of supply of steel for shipbuilding, unfavourable credit conditions on the domestic financial market and lack of subcontractor specialisation and division of work.[86]

Given Russia's general lack of competitiveness in civilian shipbuilding, its ambitions on the export market are of a limited character. In the draft version from 2018 of the Strategy for the shipbuilding industry up to 2035, the Ministry of Industry and Trade noted that in the preceding years, Russia's export of civilian products as a share of total sectoral output had been down to 2 per cent, whereas naval-related export amounted to 10 per cent.[87] Russia's key trade partners in the civilian market segment are companies and ship-owners from Azerbaijan, Kazakhstan and Turkmenistan, which corresponds to all other post-Soviet rim states of the Caspian Sea. Again, as the Caspian Sea is an inland body of water, the market is limited

[85] Rosatom 2020.

[86] Remizov 2013:21, 24–25.

[87] Ministerstvo promyshlennosti i torgovli Rossiiskoi Federatsii 2018:31.

and at current shipbuilding production rates around the Caspian Sea, the Russian estimate for mid-term market prospects is recessive.[88] Regarding the global market, in the draft version from 2018 the Ministry of Industry and Trade identified design and construction of ice-classified ships and vessels as a prospective market niche, not least due to the establishment of the above-mentioned SC *Zvezda* shipyard. Another potential market niche mentioned was smaller fishing vessels for specific African and Asian countries.[89]

In the approved Shipbuilding Strategy up to 2035, adopted in 2019, the main task of the domestic shipbuilding industry in the global market was identified as consolidation in Russia's traditional export niches, as well as geographical expansion. In particular, the task relates to high-tech civilian vessels and samples of marine equipment with high value-added. In the medium and long term, the Strategy establishes that Russia's manufacturers could count on meeting a certain share of world market demand for civilian marine equipment, including low-tonnage vessels. Other prospective directions for Russian shipbuilding industry might be floating electric generators and desalination plants.[90] In this fashion, the future for Russia's civilian shipbuilding for the global market is mainly in products with high technology content according to the Strategy. Russia's approach to civilian shipbuilding in this regard resembles the path that other European shipbuilding nations have already taken in order to remain in the high-end of the shipbuilding market and avoid direct competition with low-cost Asian shipbuilders.

3.5 Future demand for Russian-built ships and vessels

If Russia were to pursue its naval ambitions to the letter, its naval shipyards would hardly lack any construction works of new ships and vessels throughout the entire 2020s. In particular, the strategic planning instrument 'Fundamentals of State Policy in the Field of Naval Activities up to 2030', from 2017, presents a very bright future for the naval shipbuilding industry.

Article 39 of the Fundamentals states that 'the Russian Federation will not allow a significant superiority of the naval forces of other states over its Navy and will strive to consolidate it as the second in the world in terms of military capabilities'.[91] Articles 44 and 45 state that up to 2025 the basis of armament for Russia's submarine, surface and coastal forces should be high-precision cruise missiles. Af-

[88] Ibid.

[89] Ministerstvo promyshlennosti i torgovli Rossiiskoi Federatsii 2018:32.

[90] Pravitelstvo Rossiiskoi Federatsii 2019:12–13.

[91] Prezident Rossiiskoi Federatsii 2017, article 39.

ter 2025, the same forces should be equipped with hypersonic missiles and robotised systems, including autonomous unmanned submarines.[92] By 2030, the Fundamentals declare that 'Russia should have powerful balanced fleets in all strategic directions, consisting of ships designed to carry out missions in near and distant sea zones and ocean areas, as well as naval aviation and coastal troops equipped with effective high-precision strike weapons supported by a developed system for basing and support'.[93]

An apparent necessary condition to fulfil these ambitions is that Russia would soon start to procure larger naval ships than the smaller frigates and corvettes it launched in the 2010s and currently procures. That is, it would need to procure ships with longer endurance, and able to stay longer periods at sea without new supplies and replenishment. To a great extent, the 'Fundamentals of State Policy in the Field of Naval Activities up to 2030' appears to be an order product for strong naval interests within the Armed Forces or the shipbuilding industry. Considering Russian economic constraints and ship production capacity, it is likely that a substantial part of the implementation of the Fundamentals might materialise first late in the 2030s—if ever. Nevertheless, the point here is that the domestic market outlook for Russia's naval shipyards looks good well into the 2030s. This is in contrast to the export market, where opportunities will remain constrained and new actors such as China and India might challenge Russia's current market position within certain segments.

Prospects for Russia's civilian shipbuilding industry look more dismal. In all likelihood, the industry will have to muddle through the 2020s, much in the same manner as earlier, during the entire post-Soviet period. On the domestic market, the main reason is the persistent mismatch between the needs for new ships and vessels and actual demand, due to lack of long-term investment capital.

According to the analysis provided in the Shipbuilding Industry Strategy-2035, which was launched in 2019, Russia's transport sector requires 250 new sea transport vessels and more than 1500 river-sea transport vessels by 2035. The fishing industry needs 1640 vessels, and the auxiliary and technical fleets more than 250 vessels and units of marine equipment. Other domestic requirements identified in the Shipbuilding Strategy are 90 scientific and research vessels, and 24 icebreakers, as well as 150 vessels and units for development of offshore fields.[94]

At the same time, the current insufficient workload of Russia's domestic shipbuilding organisations reflects the limited financial capabilities of most potential domestic customers. The shipbuilding industry strategy notes that it is not possible to fulfil more than 18 per cent of the need for sea transport ships, 6 per cent of that

[92] Prezident Rossiiskoi Federatsii 2017, articles 43–44.

[93] Prezident Rossiiskoi Federatsii 2017, article 46.

[94] Pravitelstvo Rossiiskoi Federatsii 2019:12.

for river-sea transport vessels and 8 per cent of fishing vessels. The figures for the auxiliary and technical fleets are 43 per cent, while those for research vessels and icebreakers, as well as ships and marine technology for the development of shelf deposits amount to 11 per cent, 63 per cent and 40 per cent, respectively.[95]

As for export, given the lack of competitiveness already found among highly effective and technologically advanced shipyards in the rest of Europe vis-à-vis low-cost Asian shipbuilders, it is highly unlikely that Russia could enter the market for ordinary transport ships. As noted above, Russia's prospects for export are rather limited to certain market niches and particular submarkets. None of these, however, carries sufficient volume to compensate for the lacking domestic demand.

The weak demand for commercial shipbuilding implies that Russia's civilian shipbuilding organisations most probably will depend on unrelenting state financial support during the entire Shipbuilding Industry Strategy up to 2035, without any guarantees of ever becoming commercially viable. This, in turn, might put the military segment under pressure as well, since earmarked financial resources for the civilian segment might otherwise have been allocated to military shipbuilding.

Weak demand for commercial ships also undermines the main objective of Russia's comprehensive defence industrial strategy for the 2020s, which is to increase the share of civilian output within the defence industry. The average targets for the entire defence industry are 30 per cent civilian output by 2025 and 50 per cent by 2030.[96] Already, under optimal conditions, global experience shows that it is notoriously difficult to merge civilian and naval production within the same shipyard. In the Russian context, diversification into civilian market segments might therefore become a mission impossible for Russia's naval shipbuilding organisations.

[95] Pravitelstvo Rossiiskoi Federatsii 2019:12.

[96] Malmlöf and Engvall 2019:119.

4 The structure of Russia's naval shipbuilding industry

Like most aspects of Russian shipbuilding, its present organisational structure is an inheritance from the Soviet period. In spite of the corporatisation and privatisation that took place during the Yeltsin years, followed by the restitution of state control and power under Putin's rule, the underlying core structure—number and size of entities, their business orientation, and geographic location and so on—has hardly changed since Soviet times.

In spite of the country-specific peculiarities of the Russian shipbuilding industry, it is simultaneously subject to market forces and economic constraints that are more or less generic for the entire shipbuilding industry around the world. Here, the concept of 'industry structure' from within the subfield of industrial organisation in economics is used as an analytical tool to discuss these generic similarities.

According to this understanding of an industry structure, this concept refers to the relatively stable economic and technological dimensions providing the context in which competition within a specific industry takes place.[97] For instance, the number of firms within an industry, as well as their size, reflects market entry and exit conditions, and, in turn, opportunities to achieve economies of scale in production, research or development. Consequently, the specific industry structure determines the basic rules of competition—or lack thereof—to which all firms operating within that industry need to relate.

Where and when economies of scale do occur, and unit costs decrease with larger output, firms have incentives to expand, either through organic growth or through mergers and acquisitions.[98] In the long term, industries with prevalent economies of scale tend to gravitate towards either an oligopoly or monopoly market—or any intermediate market in between—each one with their own specific traits as regards entry and exit conditions, profits and forms of competition.

With large, fixed development and production costs, shipbuilding bears all the hallmarks of being a decreasing cost industry. Larger output means that a company is able to distribute its fixed costs over a larger number of produced units, which, in turn, would decrease the total production cost per unit.[99] However, given the high costs of a single ship, actual demand is often constrained, in contrast to other industries with analogous preconditions. Moreover, the ship construction cycle is

[97] Porter 1981:609-620.

[98] Hartley 2014:76–77.

[99] Hartley 2014:46.

also a very long process, as each ship usually takes years to complete. Once built, ships are usually intended to stay in service for at least two to three decades.[100]

Accordingly, to determine the types of vessels to develop and the quantities of ships to order at present time, meticulous forecasting about commercial shipping or future naval warfare for at least the next two to three decades ahead is imperative to commercial shipping companies as well as to national navies. Any misjudgements in this regard might have major negative long-term consequences. It is therefore common that a specific shipbuilding programme generates few serially built vessels—or even none—in addition to the lead ship.[101]

For these reasons, ship construction is usually concentrated to a smaller number of shipyards in order to keep up the number of produced units at each shipyard. The same constraints are not always applicable to subcontractors within the shipbuilding industry, as the character of their business might allow for a larger number of similar subcontractors and more competition.

Another feature of the shipbuilding industry is that if the number of vessels in a ship class is small, the industry might make less use of learning economies than other high-tech industries with a higher unit output. In other words, the shipbuilding industry might make less use of such incremental improvements in, for instance, quality, work processes, tools and tool coordination, management, and part-supply systems that originate from cumulative acquired experience from the production process.

Deficient economies of scale and learning economies relate to military shipbuilding, in particular. Commercial shipbuilding is also affected, but to a somewhat lesser extent, as commercial ship series usually are comparatively longer. Another feature that usually distinguishes naval shipbuilding from commercial shipbuilding is the strong interference of the state. The state acts both as a regulator that sets all the market rules, and as a monopsony buyer of naval ships and equipment. In many countries, but not always, the involvement of the state in naval shipbuilding also includes ownership of core shipyards, research institutes, production facilities and other entities, to an extent that is not in parity with its involvement in commercial shipbuilding.

4.1 A quantitative overview of the Russian shipbuilding industry

On the report of the 2018 draft version of the Shipbuilding Industry Strategy-2035, the Russian shipbuilding complex entails more than 600 civilian and naval entities, such as shipbuilding and ship repair yards, research organisations, project design

[100] Stopford 2009:614.

[101] The first vessel built of a specific ship programme or ship class.

bureaus and technical institutes. Manufacturers of offshore constructions and other marine equipment are also included in this figure. More than 180 organisations within the complex are directly in the loop of the Department of Shipbuilding Industry and Marine Facilities[102] of the Ministry of Industry and Trade. That leaves about 150 shipbuilding and ship repair shipyards, as well as more than 300 other companies not under direct supervision of the Department—entities that nevertheless traditionally participate in cooperative relations. In this group, small and medium-sized businesses prevail. More than three-fourths of all companies that are part of the shipbuilding industry are industrial enterprises, of which half are shipbuilding or ship repair shipyards.[103]

An alternative figure for the number of entities under the jurisdiction of the Department of Shipbuilding Industry and Marine Facilities is 206, as of January 2021. This figure is based on the department's own directory of enterprises and organisations and is updated at least once a year.[104] Inasmuch as the number of entities under the Department is most likely a stable figure without any substantial adjustments from one year to another, a plausible causal factor to the discrepancy between 180 and 206 entities might be that the directory also includes subordinate entities of major organisations, whilst the defence industrial draft strategy does not.

In addition, the draft strategy notes that there are over three thousand supplying organisations outside the industrial core. They provide the core industries sector with, for instance, accessory equipment, materials and production inputs, as well as basic electronic components.[105]

4.2 The naval subset of the shipbuilding industry

In July 2015, the naval subset of the shipbuilding industry amounted to 134 entities, according to the latest known published List of Organisations included in the Consolidated Register of the Defence Industrial Complex.[106] It is assumed in this report that the number of companies remains reasonably stable over time. Nevertheless, some marginal changes are known to have taken place since 2015, and others appear to have been likely.

Up to February 2021, three of the original companies in the List had been declared bankrupt, according to company register data from the USRLE database of the Federal Tax Inspection. All three were in the branch of manufacturing of electric or radio electronic naval equipment or devices, and had been incorporated as joint

[102] In Russian: *Department sudostroitelnoi promyshlennosti i morskoi tekhniki*, SPiMT.

[103] Ministerstvo promyshlennosti i torgovli Rossiiskoi Federatsii 2018:19.

[104] Ministerstvo promyshlennosti i torgovli Rossiiskoi Federatsii 2021.

[105] Ministerstvo promyshlennosti i torgovli Rossiiskoi Federatsii 2018:19.

[106] Ministerstvo promyshlennosti i torgovli Rossiiskoi Federatsii 2015:49–57.

stock companies, JSCs. One of these, the *Zavod Elektropribor*, had had only one owner, the state-controlled *Kontsern Morinformsistema—Agat*. There is too little material available to make any general deductions, but it appears that strong state interests do not provide automatic protection from bankruptcy or business closures.

Another four companies on the List of 2015 have demised themselves, although some of their business activities might still be up and running under the aegis of another entity. The two first entities in this group were holding companies with coordinating functions within the United Shipbuilding Corporation,[107] USC. They were liquidated due to corporate restructuring. The third, the privately owned Volgograd Shipyard, became bankrupt in mid-2013 and has since then been in the process of liquidation. Finally, the *Zavod Dvigatel*, in Saint Petersburg, a producer of torpedoes and mines, ceased to exist as a legal entity entirely in its own capacity in September 2019, when it was merged into its main owner, the *Concern Sea Underwater Weapon–Gidropribor*,[108] a state research centre for fundamental and applied R&D in underwater weapons.

One remaining possible source of error is that register data does not reveal whether any of the remaining companies might have lost their defence industrial status since 2015 and that they therefore would no longer be a part of Russia's defence industry complex. Nor is it known whether any other companies have been added since 2015. However, one possible candidate that has been included here is the public JSC *Iuzhnyi tsentr sudostroeniia i sudoremonta, IuTsSS*. This USC entity is a holding company with coordinate functions for a production division consisting of four shipyard companies in the Astrakhan region. One of these companies, the shipyard *Lotos*, was represented in the Consolidated Register in 2015. As *IuTsSS* has a controlling stake in this entity, it meets the criteria for being added to the Register.[109] It also controls a fourth of the shares in another naval-listed shipyard, the *Zavod Nizhegorodskii Teplokhod*.[110]

Based on these data, it is here assumed that the naval subset of the shipbuilding industry included in the Consolidated Register of the Defence Industrial Complex amounts to 128 organisations. There is, however, a remaining marginal of error that is not possible to control for with open source material. Some companies might have been excluded from the register and others might have been included.

[107] In Russian: *Obedinennaia sudostroitelnaia korporatsiia*, OSK.

[108] In Russian: *Kontsern Morskoe podvodnoe oruzhie – Gidropribor*.

[109] IuTsSS 2020.

[110] Zavod Nizhegorodskii Teplokhod 2021.

4.3 Organisational form and ownership

For the 128 entities in this study, there is no obvious correlation between their organisational form or ownership structure and being under the regulatory framework of the Ministry of Industry and Trade. All entities in the sample were registered either as federal state unitary enterprises, public or as private joint-stock companies, or as limited liability companies. The forms of Russian legal entities and their proximate equivalents in English are demonstrated in Table 4.1. In this report, the abbreviations FSUE, JSC and LLC are used to signify the different Russian company forms, if not stated otherwise.

Table 4.1: Types of legal entities in Russia and their proximate equivalents in English[111]

Russian name	Ru. abbr.	Ru transl.	Abbr. in En	English name (AE; BE)	En. abbr.
Unitary Enterprises					
Федеральнное государственное унитарное предприятие	FGUP	Federal state unitary enterprise	FSUE	–	–
Joint-stock companies					
Открытое акционерное общество / Публичное акционерное общество	OAO/PAO	(Public) Joint-Stock Company	(P)JSC	Limited liability partnership/Corporation; Public limited company	LLP/Inc., Corp.; plc
Закрытое акционерное общество/Непубличное акционерное общество	ZAO/NAO	(Non-Public) Joint-Stock Company	(N)JSC	Private limited company	LLC; Ltd.
Private limited companies					
Общество с ограниченной ответственностью	OOO	Limited Liability Company	LLC	Limited liability company; Private company limited by shares	LLC; Ltd.

Remarks: AE, American English; BE, British English

Back in 2015, two entities were still registered as federal state unitary enterprises, FSUEs.[112] This kind of business entity is a remnant from the Soviet period. In modern Russia, this is the organisational form that most closely mimics the legal and economic relationship that existed between the Soviet industrial branch ministries and their subordinated companies. An FSUE holds assets under economic management or under operative management, but the assets belong to the federal government. They are indivisible and may not be apportioned into contributions such as shares.[113] Another important attribute of FSUEs is that they are obliged to transfer at least 50 per cent of their net profit to the federal budget on a yearly basis.[114]

[111] Based on author's compilation and own a ssessment based on different sources.

[112] In Russian: *Federalnoe gosudarstvennoe unitarnoe predpriiatie*.

[113] Russian Civil Code 2000.

[114] Pravitelstvo Rossiiskoi Federatsii 2002.

After August 2016, the only remaining FSUE within the naval shipbuilding industry is the *Krylov* State Research Centre, a research institute carrying out research in shipbuilding and design.

The majority of the remaining entities are registered as joint stock companies, JSCs, of which 88 are listed as non-public and 33 as public JSCs. For one JSC, its registered data does not reveal whether it is public or non-public. Four entities are registered only as limited liability companies, LLCs.

Apart from the FSUE form of organisation, which obviously relates to an entity directly owned and controlled by the state, there is no strong connection between the organisational form of an entity and the underlying ownership structure. Thus, taken together, in 2021, twenty entities in the sample are listed as federal property. Of these, three entities are public JSCs and sixteen are non-public JSCs. One FSUE remains, the *Krylov* State Research Centre. In eight of the cases, the Federal Agency for State Property Management, *Rosimushchestvo*, is listed as the proprietor. Different state corporations—themselves subordinated to *Rosimushchestvo*—control the remaining twelve entities.

The next group in the sample based on ownership is the largest. It consists of 58 entities categorised as private property. This classification gives rise to some confusion, as it appears not to have been consistently used in any particular manner. The owners behind 22 of these entities are different physical persons; at least one company appears to be a pure family business, given the composition of its board of directors. All other entities, by contrast, are affiliated with other companies, some of which are the same state corporations subordinated to *Rosimushchestvo* referred to above. The four LLCs mentioned above belong here; the remaining entities are registered either as public or as non-public JSCs.

The following group is comprised of 35 entities. It relates to entities that are owned by a Russian legal person and based on the combination of various forms of Russian ownership with a share of federal ownership. All entities in this group are organised either as public or as non-public JSCs. Again, the most common owners are the state corporations already mentioned.

Three companies are registered as mixed Russian property, with a share of ownership between Russian legal entities and any of the constituent entities of the Russian Federation. In two of the cases, the likely state constituent is the Ministry of Land and Property Relations of the Republic of Tatarstan. All three entities are organised as non-public JSCs.

The ownership structure of the eleven final entities is defined as mixed Russian ownership by a Russian legal entity, being based on the consolidation of property of various forms of Russian ownership and the absence of a share of state ownership. Once more, looking at the actual ownership of these companies, it appears to

be a mixture including physical persons, state corporations and, in one case, the Ministry of Land and Property Relations of the Republic of Tatarstan.

As follows from this compilation, the relationship between organisational form and ownership structure shows no obvious pattern. It appears to be more randomised than correlated. The actual involvement of a state corporation in the ownership structure of a company seems not to have any bearing on whether the company itself is officially registered as state or private property. The overall picture of organisational form and ownership is rather chaotic, more than anything else. The registered ownership classification therefore seems to have very little impact on the federal state management of the naval shipbuilding segment.

4.4 Geographic distribution

Given the sample of 128 entities used in this report, the naval shipbuilding industry is represented in 27 of Russia's 83 recognised federal subjects. If the Russian-occupied city of Sevastopol and the Republic of Crimea are included, despite the fact that they are not internationally recognised as Russian territory, then the shipbuilding industry is represented in 29 out of 85 federal subjects. Figure 4.1 shows in which cities the industry is represented. Figures 4.2–3 show the number of companies and their division into subsectors in the the western and eastern parts of Russia and in Russian-occupied Crimea.

Most entities are concentrated to the North-Western Federal District—57 entities, or 45 per cent of the total figure. Of these, forty entities have their registered office in the city of Saint Petersburg and another seven in the surrounding Leningrad Region; five in Severodvinsk in the Arkhangelsk Region, three in Kaliningrad; and two in the Murmansk Region.

Twenty entities have their headquarters in the Volga Federal District. Half of these are situated in the cities of Bor, Gorodets or Nizhnyi Novgorod, in the Nizhnyi Novgorod Region. The Saratov Region and the Republic of Tatarstan have three entities registered in each federal subject. Two entities have their registered office in the Ulianovsk Region. In the Orenburg Region and in the Chuvash Republic, one entity is registered in each place.

In the Far Eastern Federal District, there are nineteen entities. Twelve are registered in Primorskii Krai, of which eight have their registered office in Vladivostok, two in Bolshoi Kamen and one each in Arsenev and Fokino. Of the remaining seven, four are located in the Khabarovskii Krai, and the Amursk Region, Zabaikalskii Krai and the Kamchatskii Krai each have one.

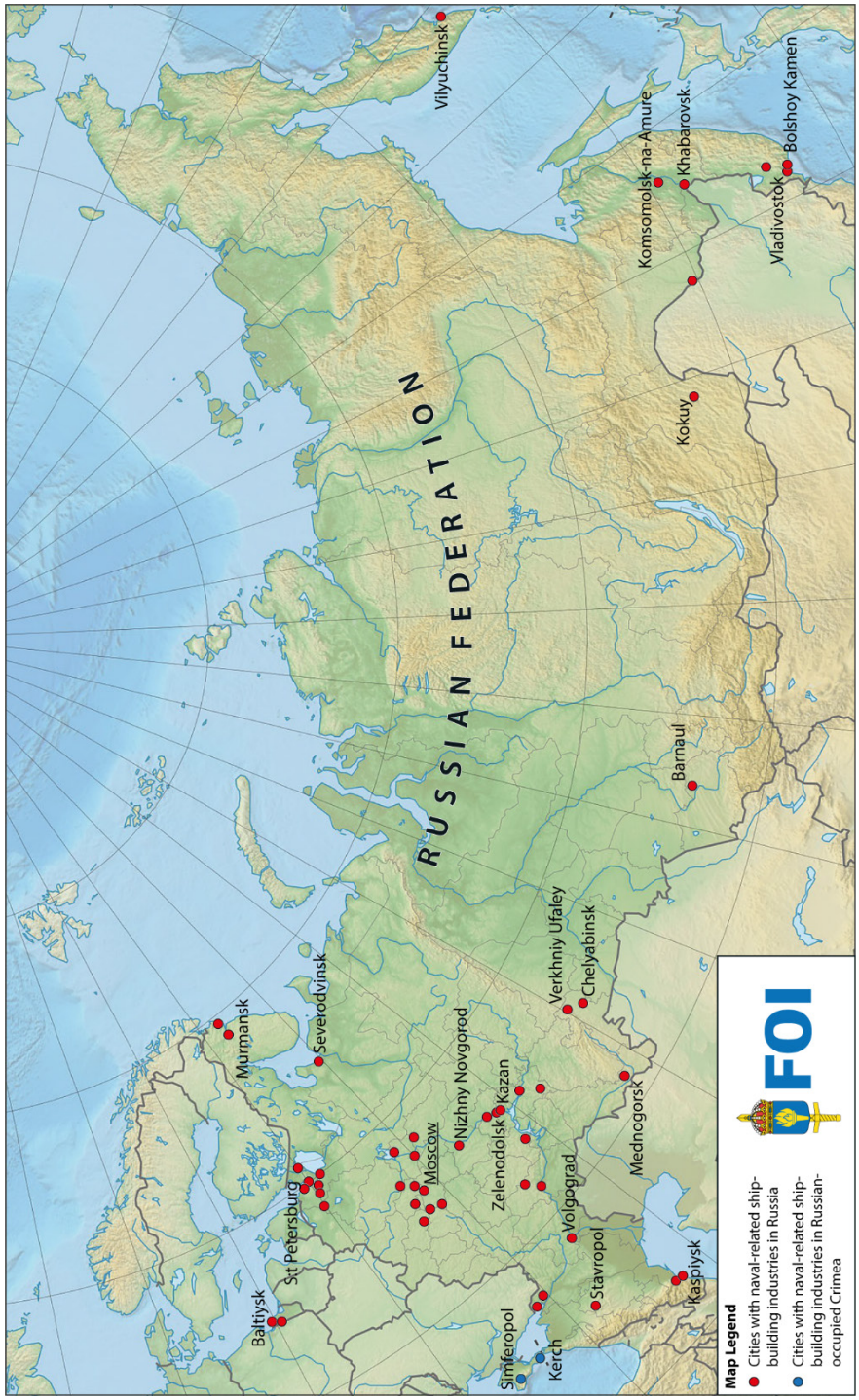


Figure 4.1: Overview of the geographic distribution of shipbuilding industries related to Russia's military-industrial complex.

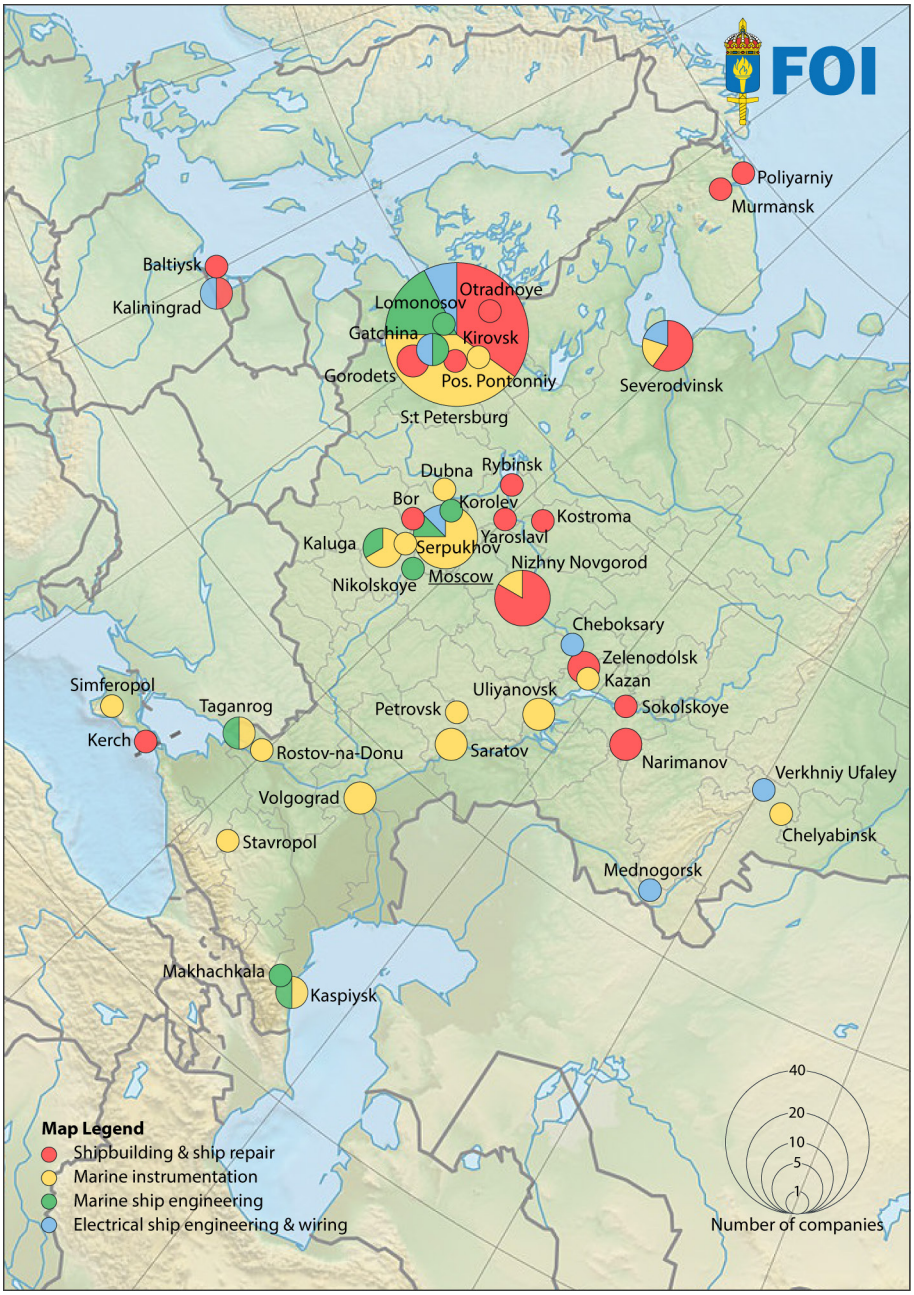


Figure 4.2: Number of shipbuilding companies related to Russia's military-industrial complex and their division into subsectors in the western part of Russia and Russian-occupied Crimea.

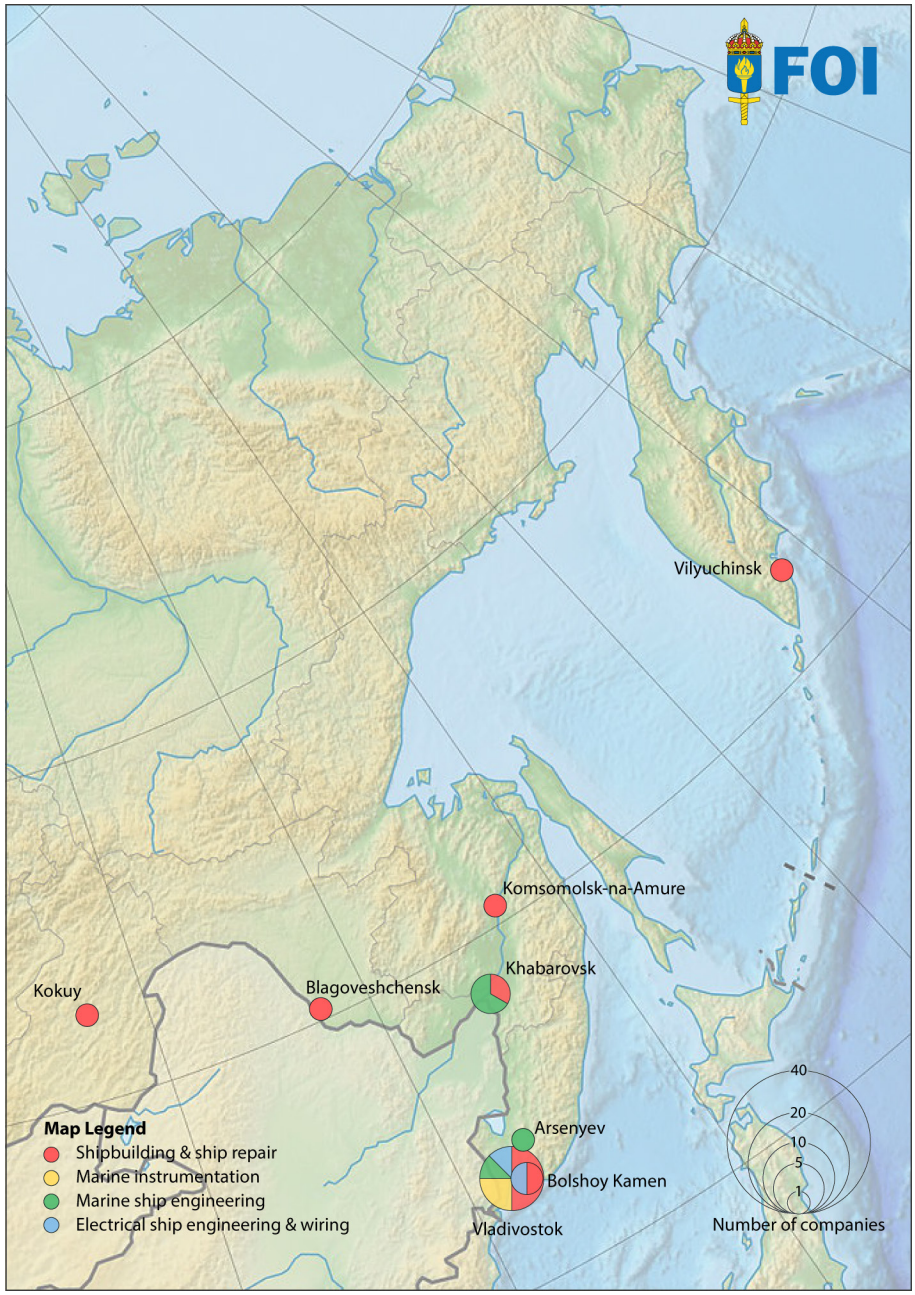


Figure 4.3: Number of shipbuilding companies related to Russia's military-industrial complex and their division into subsectors in the eastern part of Russia.

In the Central Federal District, sixteen entities are registered, of which half are located in the city of Moscow. There are two more in the Moscow Region, three in the Kaluga Region, and two in the Iaroslav Region and one in the Kostroma Region.

Of the remaining sixteen entities, nine are situated in the Southern Federal District—including two companies on the Russian-occupied Crimean Peninsula—and four in the North Caucasian Federal District, two in the Ural Federal District and one in the Siberian Federal District.

The dock capacity and distribution of shipyards and ship repair yards between the different districts are shown in Table 4.2. According to one classification system used internationally, shipyards specialising in vessels up to about 10,000 deadweight tonnes are usually considered to be small, and as a norm, they have a workforce of below 1000 employees, sometimes as few as 100–200. Medium-sized shipyards build vessels in the range 10,000–40,000 deadweight tonnes, and usually have a workforce of some 500–1500 employees. Any shipyard building vessels above that size range is considered as a large or even very large shipyard.[115] Table 4.3 relates the shipyard dock capacity to the actual size of some of Russia's naval ships and vessels in service.

The preponderance of naval shipbuilding entities in the North-Western Federal District is thus significant, compared to the other districts. The geographical distortion between the different federal districts impinges on the functional composition of the shipbuilding industry in each district. The North-Western Federal District appears to be the most versatile, with, for instance, seven shipyards and four ship repair plants; eleven factories for different kinds of naval and maritime equipment; nine research institutes; five central construction bureaus and two project design bureaus. The combined expertise within the district allows construction of both surface ships and submarines, including nuclear propelled vessels. In the Saint Petersburg region, the maximum capacity is surface ships with a displacement of up to 25,500 tonnes, whilst in Severodvinsk the capacity is for vessels up to 85,000 tonnes. The main internal weakness of the North-Western Federal District is that it is split between three geographic clusters, with long distances in between, namely the Saint Petersburg region, Kaliningrad, and the Severodvinsk-Murmansk area.

[115] Stopford 2009: 639.

Table 4.2: Dock capacity, in tonnes, of Russia's naval shipbuilding and ship repair yards[116]

Name	City	Region	Dock capacity (*dwt*)
Central District			
IaSZ	Iaroslavl	Iaroslavl obl.	3200
Shipyard of Brothers Nobel	Rybinsk	Iaroslavl obl.	(Slipway) 2700
SZ Vympel	Rybinsk	Iaroslavl obl.	1000
Northwestern District			
PO Sevmash	Severodvinsk	Arkhangelsk obl.	85,000
Ship repair centre Zvezdochka	Severodvinsk	Arkhangelsk obl.	15,000
SRZ-33	Baltiisk	Kaliningrad obl.	4500
Pribaltiiskii SZ Iantar	Kaliningrad	Kaliningrad obl.	12,000
Leningradski SZ Pella	Otradnoe	Leningrad obl.	n/d
Sredne-Nevskii SZ	Pontonnyi	Leningrad obl.	2700
SRZ-82	Murmansk	Murmansk obl.	n/d
SRZ-10	Poliarnyi	Murmansk obl.	n/d
Admiralteiskie verfi	Saint Petersburg	Saint Petersburg	70,000
Baltiiskii zavod	Saint Petersburg	Saint Petersburg	25,500
SF Almaz	Saint Petersburg	Saint Petersburg	3000
SZ Severnaia verf	Saint Petersburg	Saint Petersburg	4500
Southern District			
IuTsSS	Narimanov	Astrakhan obl.	2400
SZ Lotos	Narimanov	Astrakhan obl.	6000
SZ Zaliv (Ukraine)	Kerch	Crimea	150,000
Volga District			
Zavod Nizhegorodskii Teplokhod	Bor	Nizhegorod obl.	1500
SSK	Gorodets	Nizhegorod obl.	3500
SZ Volga	Nizh. Novgorod	Nizhegorod obl.	n/d
Zavod Krasnoe Zormovo	Nizh. Novgorod	Nizhegorod obl.	13,000
Sokolskaia sudoverf	Sokolskoe	Nizhegorod obl.	1500
Zelenodolskii zavod imeni A.M. Gorkogo	Zelenodolsk	Republic of Tatarstan	2200
Far Eastern District			
SZ imeni Oktiabrskoi revolutsii	Blagoveshchensk	Amyrskaia obl.	1500
North-Eastern Ship Repair Centre	Viliuchinsk	Kamchatka krai	13,500
SRZ-179	Khabarovsk	Khabarovsk krai	n/d
Amurskii SZ	Komsomolsk-na-Amure	Khabarovsk krai	25,000
Khabarovskii SZ	Khabarovsk	Khabarovskii krai	1500
Far Eastern Plant Zvezda	Bolshoi Kamen	Primorskii krai	13,500
SRZ-30	Dunai, Fokino	Primorskii krai	n/d
Ship Repair Centre Dalzavod (incl. SRZ-178)	Vladivostok	Primorskii krai	35,600
SRZ-92	Vladivostok	Primorskii krai	5,000
Vostochnaia verf	Vladivostok	Primorskii krai	3,500
Sretenskii SZ	Kokui	Zabaikalskii krai	n/d

Remarks: Obl.—Oblast; SZ—Shipyard; SRZ—Ship repair yard; n/d—No data. The Zaliv shipyard has been taken over by force by Russia since the occupation of the Crimea peninsula.

[116] Author's compilation and own assessment based on different sources.

Table 4.3: Actual size of some Russian naval ships and vessels in service[117]

Class	Project	Maximum length (*m*)	Maximum width (*m*)	Std. displacement (*tonnes*)
Heavy aircraft-carrying cruiser				
Kuznetsov class	1143.5	306.45	71.96	46,540
Battlecruisers				
Kirov class	11442	250.1	28.5	23,750
Cruisers				
Slava class	1164	186.4	20.8	9380
Destroyers				
Udaloy class	1155	163.5	19.0	6980
Sovremennyi class	956	145.0	17.2	6500
Frigates				
Grigorovich class	11356M	124.8	15.2	3620
Adm. Gorshkov class	22350	135.0	16.4	4550
Corvettes				
Buyan-M class	21631	74.1	11.0	850
Steregushchiy class	20380	90.0	13.0	1800
Nuclear-powered submarines				
Borei class	955	170.0	13.5	(Surfaced) 14,720
Yasen class	885M	130.0	13.0	Surfaced) 8600
Conventional attack submarines				
Improved Kilo class	636.3	73.8	9.9	(Surfaced) 2350
Lada class	677	66.8	7.1	Surfaced) 1765

In the Volga Federal District, there are six shipyards, but with a maximum capacity of 6000 tonnes; no shipyard is close to that of the North-Western Federal District. Although there is knowledge as well as equipment to build even atomic submarines in the district, it seems that none has been built since the 1990s. The largest shipyard, the *Zavod Krasnoe Sormovo*, is currently focusing on building mixed river-sea tanker ships and cruise ships adapted for the Russian river system. There is also some production of maritime and naval equipment and instruments in the district, as well as some construction bureaus. As there is a mismatch between supply and demand, the naval shipbuilding industry in the Volga Federal District depends on extensive cooperation with organisations from other districts.

In the Far Eastern Federal District, there are seven shipyards with a maximum capacity to build surface ships of up to 25,000 tonnes. There are also six ship repair plants, and some factories for equipment or instrument making. Notably, there are no research institutes or design bureaus in the Far Eastern Federal District. This means that these competencies must be brought in from other parts of Russia, and

[117] Author's compilation based on different sources.

that the Far Eastern Federal District appears to be more of a functional production unit for shipbuilding and repair than a centre for forward-looking technological development. The most dynamic development that is taking place in the Far Eastern District involves the Far Eastern Shipbuilding and Ship Repair Center, FESRC.[118] This *Rosneft*-owned corporation has gathered the main ship-repair and shipbuilding production facilities in Russia's Far East. It is also the project operator of the *Zvezda* Shipbuilding Complex, a *Rosneft*-sponsored project running from 2012 to 2024, aiming at modernising and increasing Russian shipbuilding capacity and capability in the Far East.[119]

Although there are three shipyards in the Central Federal District, if the Shipyard of Brothers Nobel is included, as well as three manufacturing entities, the district is primarily characterised by the scientific and ship engineering work that takes place there. In the area are four research institutes, two scientific production institutes and three construction bureaus of different status. Several of these entities are subjugated to larger corporations with activities in several districts, which indicate their significance on a national level.

Six of the nine entities in the Southern Federal District are daughter companies to some of the larger company groups in Russian naval shipbuilding. The only shipyard in Russia proper is the above-mentioned *Lotos* shipyard, within the USC sphere. In spite of its representation in the Consolidated Register, this shipyard nowadays appears to specialise in building commercial dry cargo ships developed by the Marine Ship Engineering Bureau, a private Russo-Ukrainian Ship engineering company.[120] Large-scale shipbuilding capacity was added to the district through the Russian occupation of Crimea and the forced takeover of the Ukrainian *Zaliv* shipyard, in Kerch, Crimea, by interests allegedly close to the *Zelenodolskii zavod imeni A.M. Gorkogo* shipyard, Republic of Tatarstan.[121] The dry dock of the *Zaliv* shipyard is one of the largest in Europe, with a length of 360 metres, a width of 60 metres and a depth of 11 metres, allowing construction of ships with a deadweight of up to 150,000 tonnes.[122] On July 20, 2020, two Project 23900 Ivan Rogov-class amphibious assault ships *(Ivan Rogov* and *Mitrofan Moskalenko*) were laid down at the Zaliv shipyard in the presence of President Putin. Later information suggests that their displacement might be up to 40,000 tonnes.[123]

[118] In Russian: *Dalnevostochnyi tsentr sudostroeniia i sudoremonta, AO DTsSS.*

[119] FESRC 2020?a.

[120] Morskoe Inzhenernoe Biuro 2021.

[121] Sudostroitelnyi zavod Zaliv 2014; Bmpd 2014.

[122] Sudostroitelnyi zavod imeni B.E. Butomy 2021.

[123] *RIA Novosti* 2020.

The remaining seven companies spread out in the North Caucasian, the Ural and the Siberian Federal Districts are all factories or instrument makers. All but one are owned by larger corporations.

Reminiscent of previous periods in Russian history, the centre of gravity for Russian naval shipbuilding is still the North-Western Federal District. The City of Saint Petersburg is the unrivalled capital of Russian shipbuilding, and Kaliningrad and Severodvinsk are its most important satellites. Meanwhile, the creation of FESRC and the *Zvezda* Shipbuilding Complex Project, in the Far East, as well as the transposition of the Zaliv shipyard into Russia's naval shipbuilding programme in the South, demonstrates the great importance that Russian industrial and naval planners attach to the rejuvenation and increased shipbuilding capacity in these regions.

5 Company groups and their production

The 2018 draft version of the Strategy for the Development of the Shipbuilding Industry for the Period up to 2035, which was put in writing by the Ministry of Industry and Trade, identified four subsectors in shipbuilding: shipbuilding and ship repair; maritime instrumentation; ship engineering; electrical engineering and wiring.[124] Companies involved in production of naval arms systems and platforms are usually included either in the maritime instrumentation or in the ship-engineering segment.

This classification to a great extent also acts as a central determinant both for the overall industrial structure and for the internal organisation of the various company groups or major corporations in Russian shipbuilding. Most corporations consist of horizontally integrated entities, that is, clustering companies with the same kind of production, in order to obtain both economies of scale and scope.

Regardless of this dominating trait, the picture is often more complicated, as many corporations demonstrate some features of vertical integration as well. There is no obvious pattern here; there are examples both of backward integration into suppliers, such as construction bureaus or component manufacturers, and of forward integration into installation and commissioning firms or maintenance and repair companies. A corporation might therefore have subsidiaries within one or several subsectors, even if most subsidiaries will belong to the same subsector.

Below follows a more detailed analysis of the dominating company groups. As far as possible, the disposition of this chapter follows the Russian taxonomy for shipbuilding subsectors. Section 5.1 is comprised of the shipbuilding and ship repair yards, together with some research institutes related to shipbuilding activities. Section 5.2 is made up of entities associated with marine instrumentation. It includes entities involved in different hydroacoustics and radio applications and research, including certain arms and subsystems for military use. Section 5.3 relates to ship engineering companies and research institutes, i.e., all kinds of mechanical systems within the shipbuilding industry. This also includes certain arms systems. Section 5.4 covers the electrical ship engineering and wiring segment, mainly all companies that install and maintain electrical equipment and cables on ships and maritime facilities, as well as manufacturers of electrical equipment and electrochemical devices.

Although the Russian taxonomy has been used for the disposition of this chapter, the current classification of companies and corporations as belonging to one or another subsector in this report is largely based on the author's own understanding

[124] Ministerstvo promyshlennosti i torgovli Rossiiskoi Federatsii 2018:19.

of the subsectors and the different business activities of the companies. Due to the author's possible misunderstanding, the classification used here might therefore differ from the actual categorisation in use in Russia. If not stated otherwise, the analysis builds on data from company web pages and register information found in Russian open databases.

5.1 The shipbuilding and ship repair segment

The shipbuilding and ship repair segment consists of shipbuilding and ship repair yards, as well as research institutes and design bureaus specialising in the design of ships and various marine equipment. Most of these entities are part of the United Shipbuilding Corporation, USC. Another actor is *Rosneft*, which started out in commercial shipbuilding, but has now also moved into naval shipbuilding. The segment also includes two scientific research centres at the federal level. One of these is the already mentioned FSUE *Krylov* State Research Centre. The other is the JSC Shipbuilding & Ship Repair Technology Center, SSTC,[125] a design and technology centre for shipbuilding and ship repair.[126]

The Krylov State Research Centre

In early 2021, the *Krylov State Research Centre* is the only remaining federal state unitary enterprise, FSUE, within the shipbuilding industry. At least since March 2017, its charter fund[127] has been in the amount of 8.62 billion roubles. The directorship of the Centre is subordinate to the Ministry of Industry and Trade. The head office and its main centre of activity are in Saint Petersburg. *Krylov* also has a registered branch in Saint Petersburg, and representative offices in Moscow and Severodvinsk, according to data from the Unified State Register of Legal entities (USRLE) of the Federal Tax Service.[128] According to information from its website, *Krylov* should have at least two more branch offices in Saint Petersburg, but they do not appear to be registered as such.[129] *Krylov* was also majority shareholder in the *Central Construction Bureau Iceberg*[130] from February 2013 to October 2020, when it was transferred to *Modern Shipbuilding Technologies*,[131] MST, an entity associated with the oil company *Rosneft*.[132]

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[125] In Russian: *AO Tsentr tekhnologii sudostroeniia i sudoremonta, TsTSS.*

[126] Ministerstvo promyshlennosti i torgovli Rossiiskoi Federatsii 2018:20.

[127] In Russian: *ustavnyi fond.*

[128] Federalnaia nalogovaia sluzhba 2021a.

[129] Krylov State Research Centre 2015; Krylov State Research Centre 2021a; Krylov State Research Centre 2021b.

[130] In Russian: *Tsentralnoe konstruktorskoe biuro Aisberg*.

[131] In Russian: *Sovremennye tekhnologii sudostroeniia*, STS.

[132] TsKB Aisberg 2020a; TsKB Aisberg 2020b.

Krylov is a key player in Russian ship research and design. In one way or another, the centre is involved in the development of all naval ship and submarine projects as well as commercial ship projects. Among its core areas are fundamental research related to marine and inland water technologies; design and design appraisals of vessels and structures intended for marine and inland water operations; research in hydrodynamics and hydroacoustics; design of ship electrical equipment and watercraft propulsion systems; design solution and development of offshore oil and gas platforms; and standardisation, unification and certification of products and quality management systems.[133]

The territory of the centre covers an area of about 100 hectares, accommodating over 100 buildings, with experimental facilities used for different purposes.[134] All these facilities and buildings imply that the centre has high fixed costs for maintenance. Even with high occupancy—, which appears not to be the case—the centre is therefore very sensitive to a fall in demand for its services. In 2019, there were far-reaching plans to transform the centre into a federal state budgetary institution,[135] FSBI. This measure would be in line with the general policy of reducing the number of FSUEs. In this case, the purpose was also to strengthen the role of *Krylov* in the development of Russian shipbuilding. In particular, FSUEs are claimed to conserve ineffective use of property and to have a negative impact on competition. Budget institutions, on the other hand, carry out purchases under the Law on the State Contract System, in the sphere of procurement; they are financed according to budget estimates, and their staffing table is negotiated with their principal.[136] Up to March 2021, these plans had not been realised. The economy of the institute remains weak, and in autumn 2020, there were more substantial reports than previously that the centre would have to lay off staff to manage its finances.[137] Up to spring 2021, there was no information indicating that *Krylov* would have been considered for debt structuring to avoid cutbacks.

The Shipbuilding & Ship Repair Technology Centre, SSTC

The *Shipbuilding and Ship Repair Technology Centre*,[138] SSTC, is a former federal state unitary enterprise, FSUE, which was incorporated in 2009. It employs about 1100 people. The SSTC belongs to the state and sorts under the Federal Agency for State Property Management *Rosimushchestvo*.[139]

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[133] Krylov State Research Centre 2021c.

[134] Krylov State Research Centre 2021d.

[135] In Russian: *Federalnoe gosudarstvennoe biudzhetnoe uchrezhdenie*.

[136] *TASS* 2019.

[137] Golovina 2020.

[138] In Russian: *AO Tsentr tekhnologii sudostroeniia i sudoremonta, TsTSS*.

[139] Federalnaia nalogovaia sluzhba 2021b.

In the context of this study, it has not been possible to identify the current board of directors or any other instruments at the disposal of the state to exercise control over the centre. However, in 2017, besides the general director of the SSTC, the Government-nominated candidates to the board were related to *Rosoboroneksport*, the Ministry of Economic Development,[140] the USC and the Ministry of Industry and Trade.[141] The nominees to the Revision Commission represented the Ministry of Industry and Trade, the National Association of Corporate Directors[142] and the Russian Presidential Academy of National Economy and Public Administration,[143] RANEPA.

Some of the internal structure of the SSTC is made up of entities that it had previously absorbed, such as the research and production company *Sudotekhnologiia*, the design company *Soiuzproektverf*, the construction bureaus *Armas* and *Vostok*, and the RUMB research centre. It has also set up a *Vneshneekonomicheskaia firma* for international cooperation that appears to be part of the internal company structure.[144] According to official register data, the SSTC has four representative offices, located in Moscow, Severodvinsk, Murmansk, and in Hanoi, Vietnam, since 2016.[145] The SSTC is also the majority shareholder in the *Zavod Burevestnik*, a ship engineering company in Gatchina, Leningrad district, and a manufacturer of ship fittings, heat exchangers, and diver propulsion vehicles.[146] The SSTC controls four of seven seats on the board of directors of the *Zavod Burevestnik*.

The main office of SSTC is located in Saint Petersburg, but as an expert organisation, it is active in several projects and as an equipment supplier along Russia's industrial belt, from Kaliningrad in the west to Vladivostok in the east, and from the Barents Sea in the north to the Caspian and Black Seas in the south. It also claims that it has extensive cooperation with some 30 countries in civilian and naval shipbuilding, especially with India, Vietnam, Norway, Finland, Germany, Italy, Spain, France, the Netherlands, South Korea, Japan, Venezuela, Brazil, Bulgaria, and the United States.[147]

SSTC, in addition to the *Krylov* Centre, is a scientific centre of federal significance and a key player in the Russian shipbuilding industry. It conducts fundamental, exploratory and applied research aimed at creating modern technologies for ship-

[140] In Russian: *Mininsterstvo ekonomicheskogo razvitiia, Minekonomrazvitiia*.

[141] Pravitelstvo Rossiiskoi Federatsii 2017.

[142] In Russian: *Natsionalnaia assotsiatsiia korporativnykh direktorov, NAKD.*

[143] In Russian: *Rossiiskaia akademiia narodnogo khoziaistva i gosudarstvennoi sluzhby pri Prezidente Rossiiskoi Federatsii, RANKhiGS.*

[144] Shipbuilding & Shiprepair Technology Centre 2019.

[145] Federalnaia nalogovaia sluzhba 2021b.

[146] Zavod Burevestnik 2021.

[147] Tsentr tekhnologii sudostroeniia i sudoremonta 2021a.

building, ship repair and mechanical engineering. Another area of work is the development and implementation of large investment projects for setting up and modernising shipbuilding and ship repair yards.[148] In short, the SSTC is not so much involved in actual shipbuilding and repair as in the research and engineering work to create effective preconditions for ship construction and design.[149]

The United Shipbuilding Corporation—USC

The United Shipbuilding Corporation, USC, is an entirely state-owned public joint-stock company that also happens to be the largest shipbuilding corporation in Russia. Taken together, the USC and its subsidiaries allegedly employ about 95,000 people.[150]

The USC is under direct control of the Federal Agency for State Property Management, *Rosimushchestvo*. State influence over the company is reflected in the composition of its board of directors. It is made up of persons representing other state companies, such as *Rostec*, *Gazprom*, *Rosatom*, *Sovcomflot* and *Rosneft*, as well as some ministries and state agencies, such as the Ministry of Defence, the Military-Industrial Commission, the Ministry of Industry and Trade, the Ministry of Agriculture and the Federal Agency for Fishery. The chairman of the board is Georgii Poltavchenko, the previous governor of the city of Saint Petersburg, until October 2018, when he took up his current position. Company management, on the other hand, appears to have been recruited more strictly in line with professional backgrounds.[151]

As stated in its List of Affiliated Persons, from December 2020, the USC was then comprised of 37 companies, in which it either had at least 20 per cent of the votes or owned at least 20 per cent of the stock capital.[152] Almost two-thirds, or 24 entities, were in the List of Organisations from 2015. They are part of the naval subset of the shipbuilding industry and are listed in Table 5.1. According to that table, the USC is essentially a horizontally integrated shipbuilding and ship repair organisation; it is made up of the majority of the main shipbuilding and ship repair yards in Russia and many of the leading design bureaus. Besides this principal direction—but closely associated with it—the table also includes two companies involved in ship engineering and one company in electrical engineering and wiring.

[148] Shipbuilding & Shiprepair Technology Centre 2021; Tsentr tekhnologii sudostroeniia i sudoremonta 2021b.

[149] Shipbuilding & Shiprepair Technology Centre 20??.

[150] USC 2021a.

[151] USC 2021b.

[152] USC 2020.

Table 5.1: Affiliated companies of the United Shipbuilding Corporation[153]

Name	City	Sub-industry	Field of interest	Type of work
SDEBE	Moscow	Electr. engr.	Electrochemical air regen.	Design & constr.
Proletarskii zavod	St. Petersburg	Ship engr.	Marine & power engr.	Design & constr.; Manufacture; Maint. & repair
KhSZ	Khabarovsk	Ship engr.	Ship winches & cranes; Water jet ejectors; Heat exchangers	Manufacture
NPA Arktika	Severodvinsk	Electr. engr.	Subm (D/E); Surface ships; Deep-sea eqpm; Drilling rigs	Installation work
IuTsSS	Narimanov	Shipb. & rep.	Subm (D/E, N); Surface ships	Holding company
NIPTB Onega	Severodvinsk	Shipb. & rep.	Project design	R&D
KB Vympel	Nizh. Novgorod	Shipb. & rep.	Surface ships	Design & constr.
Nevskoe PKB	St. Petersburg	Shipb. & rep.	Surface ships	Design & constr.
Severnoe PKB	St. Petersburg	Shipb. & rep.	Surface ships	Design & constr.
SPMBM Malakhit	St. Petersburg	Shipb. & rep.	Subm (D/E; N)	Design & constr.
TsKB MT Rubin	St. Petersburg	Shipb. & rep.	Subm (D/E, N)	Design & constr.
TsMKB Almaz	St. Petersburg	Shipb. & rep.	Surface ships	Design & constr.
10 SRZ	Poliarnyi	Shipb. & rep.	Subm (D/E, N); Surface ships	Repair yard
33 SRZ	Baltiisk	Shipb. & rep.	Surface ships	Repair yard
Admiralteiskie verfi	St. Petersburg	Shipb. & rep.	Subm (D/E); Surface ships; Icebreakers	Shipyard
ASZ	Komsomolsk-na-Amure	Shipb. & rep.	Subm (D/E, N); Surface ships	Shipyard
Baltiiskii zavod	St. Petersburg	Shipb. & rep.	Surface ships; Icebreakers	Shipyard
Zavod Krasnoe Sormovo	Nizh. Novgorod	Shipb. & rep.	Subm (D/E, N); Surface ships; Deep-sea rescue eqpm.	Shipyard
PSZ Iantar	Kaliningrad	Shipb. & rep.	Surface ships	Shipyard
SZ Severnaia verf	St. Petersburg	Shipb. & rep.	Surface ships	Shipyard
SNSZ	Pontonnyi	Shipb. & rep.	Composite shipbuilding	Shipyard
TsS Zvezdochka	Severodvinsk	Shipb. & rep.	Subm (D/E, N); Surface ships	Shipyard
PO Sevmash	Severodvinsk	Shipb. & rep.	Subm (D/E; N); Surface ships	Manufacture
Khabsudmash	Khabarovsk	Shipb. & rep.	Winches, cranes; Heat exchangers	Manufacture

Remarks: Subm, submarine; D/E, diesel-electric; N, nuclear. Engr., engineering. Shipb. & rep., shipbuilding and repair. Field of interest relates to stated fields of interest, not actual production. For instance, no construction of submarines is currently taking place at *ASZ* or *Zavod Krasnoe Sormovo*.

[153] Author's compilation of data from various Russian databases.

Not included in the table are the unseen substructures of USC. As already mentioned above, the *Iuzhnyi tsentr sudostroeniia i sudoremonta*, IuTsSS, has its own subsidiary companies: the shipyard *Lotos*, and the *Zavod Nizhegorodskii Teplokhod*. The latter is a shipyard for construction of auxiliary ships for the naval fleet based in the city of Bor, in the Nizhnyi Novgorod Region.[154] In both cases, *IuTsSS* is a co-owner, together with the JSC Vega and the LLC *Elektroprivod-Tsentr*.

In addition, there are also subsidiaries in the second tier of USC not recognised as USC companies. For instance, in Nizhnii Novgorod, the USC subsidiary *Zavod Krasnoe Sormovo*[155] shipyard controls a blocking minority of 25.0015 per cent of the shares in the local construction bureau *Lazurit*, a specialist in submarine design and construction. Moreover, in this case, the vice president for technical development of the USC occupies one of the five seats[156] on the board of directors of *Lazurit*;[157] yet the *Lazurit* is not recognised as a USC subsidiary. The USC is also a direct minority shareholder in two other companies that are not listed as its subsidiaries.

Other substructures not included in Table 5.1 are the branches of the *Ship Repair Centre Zvezdochka*,[158] which are listed in Table 5.2. Organised as branches, they do not qualify to be included in the List of Organisations in their own capacity. Together with its branch organisations, the key competency of *Zvezdochka* 'is repair, modernisation, refit and disposal of ships, vessels and other marine equipment of any class and purpose, including the ones with nuclear power plants'.[159] The branches are quite large in themselves, and under other circumstances would probably be organised as companies in their own capacity. Besides the branches, *Zvezdochka* also has representative offices in Moscow and in Saint Petersburg.

Almost all of the USC companies, including its naval subset, are situated in European Russia, with a geographical centre of gravity around Saint Petersburg. Its only remaining subsidiaries in the Far Eastern District are the *Khabarovsk Shipbuilding Yard*[160] and the *Amur Shipbuilding Plant*[161].

[154] Iuzhnyi tsentr sudostroeniia i sudoremonta 2021.

[155] At present, *Zavod Krasnoe Sormovo* only builds civilian ships. In April 2005, the last submarine, a Project 636 *Varshavianka*, left the factory harbour.

[156] The other four seats are occupied by persons affiliated with the oil company *Rosneft*, which controls 14.9982 per cent of the shares through a LLC investment company.

[157] TsKB Lazurit 2020.

[158] In Russian: *Tsentr sudoremonta Zvezdochka*.

[159] Zvezdochka 2021?.

[160] In Russian: *Khabarovskii sudostroitelnyi zavod*, KhSZ.

[161] In Russian: *Amurskii sudostroitelnyi zavod*, ASZ.

Table 5.2: Branches of the Ship Repair Centre Zvezdochka, a subsidiary to USC[162]

Name	City	Sub-industry	Field of interest	Type of work
NPO Vint	Moscow	Ship engr.	Watercraft propulsion systems; Propellers	Design & constr.
Opytnyi zavod Vega	Borovsk	Shipb. & rep.	Watercraft propulsion systems; Propellers	Manufacture
5 SRZ	Temriuk	Shipb. & rep.	Surface ships	Repair yard
35 SRZ	Murmansk	Shipb. & rep.	Surface ships; Armament	Repair yard
Astrakhanskii SRZ	Astrakhan	Shipb. & rep.	Surface ships; Armament	Repair yard
Sevastopolskii morskoi zavod	Sevastopol	Shipb. & rep.	Surface ships	Repair yard
SRZ Krasnaia kuznitsa	Arkhangelsk	Shipb. & rep.	Surface ships	Repair yard
SRZ Nerpa	Snezhnogorsk	Shipb. & rep.	Submarines (N); Surface ships; Disposal of submarine nuclear reactors	Repair yard

Remarks: Engr., engineering. Shipb. & rep., shipbuilding and repair.

The USC is one of Russia's so-called national champions, huge company conglomerates that Russian decision-makers have created in order to consolidate entire industrial sectors and turn them into engines for economic growth and technological development. The USC is ostensibly an impressive company conglomerate, having consolidated over 80 per cent of design and production capacities across Russian territory. It is also a very versatile ship builder, with a large shipyard capacity and expertise in building a wide range of warships and submarines, along with icebreakers, transport, rescue and auxiliary vessels, as well as marine equipment for continental shelf development.[163] More specifically, as of early 2021, the USC took credit for eleven submarine and midget submarine projects, sixteen warship projects, five support vessel projects and training sets, two minesweeper projects, four landing ship and boat projects and eleven patrol ship and boat projects.[164] The commercial portfolio of the USC contains nine icebreaker and special-purpose vessel projects, eighteen different projects for vessels and equipment for offshore development, fourteen transport vessel projects, four specialised vessel projects, six different fishing vessel projects, two projects regarding industrial vessels, and seven passenger ship projects.[165] Thus, the USC fulfils the criteria for economics of scope, but as most naval ship series are relatively short, it nevertheless remains difficult to obtain economies of scale.

[162] USC web page, Russian and English versions.

[163] USC 2021a.

[164] USC 2021c.

[165] USC 2021d.

In parallel, from the outside there is a widespread view on the corporation as an unmanageable behemoth. First, USC does not seem to have an established geographical management structure, and therefore it appears to be more like a state agency that rules over a number of shipyards than a consolidated company group. Second, like other core defence corporations, the USC became heavily indebted in the 2010s. In May 2020, there were reports that the USC had become an object of government debt restructuring measures aimed at the financial recovery of enterprises within the defence industrial complex.[166] In this respect, however, it does not matter that the causes for the indebtedness of the defence industry appear to depend more on an inferior reimbursement model within the Russian military procurement system than on shortcomings in industrial management; outside experts nevertheless blame the industry for these failures. Third, there is also widespread disappointment that the creation of the USC Corporation has not brought about any anticipated synergy effects analogous to those perceived at the creation of other defence industrial conglomerates or national champions. For that reason, there is a widespread perception that USC is persistently plagued with severe management problems that have not been remedied by any of the reorganisations that have taken place so far. In particular, delivery delays for naval projects appear, rather, to be the rule than the exception, and their causes are usually analysed in depth by defence experts both in Russia and abroad.

However, according to Aleksei Rakhmanov,[167] president of the USC, although there are still one or two objects per year that fall outside the established time frame, under his watch the corporation has steadfastly approached its goal of achieving the yearly state defence orders without any delays. Those delays that do occur are mainly a concern as regards the lead ships or objects, according to Rakhmanov, as in these cases there is a sufficiently high degree of uncertainty in the performance of machines, systems and mechanisms. The engagement in a multitude of dissimilar new shipbuilding projects in the 2010s has been a problem for USC, but as shipbuilding in Russia in the 2020s has entered a phase with more serially built surface ships and submarines, on-going projects now suffer less from teething pains and high degrees of uncertainty. In addition, as a top system integrator, not all of the time delays are caused by the USC. Weak production links also emerge in other parts of the value chain, according to Rakhmanov.[168] A final argument in defence of USC as regards the lacking synergy effects is that different outcomes for different national champions have to do with the fact that they are active within different arenas, and that their business activities are for that reason not comparable with each other.

[166] Vedeneeva 2020b.

[167] Before he was appointed president of the USC, Rakhmanov was vice minister of the Ministry of Industry and Trade, www.kommersant.ru/doc/2480974 (accessed 22 March 2021).

[168] *Interfaks* 2021; Sherzad 2021.

Rosneft, Gazprombank and Rosneftegaz in Russia's Far East

The second most important shipbuilder in Russia after the USC these days is the oil and gas industry. More specifically, in a decade, give or take, interests related to the *Rosneft* oil conglomerate have organised an alternative conglomerate, with a geo-economic centre of gravity in Russia's Far East and with financial backing from the *Gazprombank*.

Naturally, the primary interest that the oil and gas industry has in shipbuilding and repair yards is related to the construction of the necessary technical infrastructure for offshore drilling and exploration of the continental shelf, along with maritime transport of petroleum products. However, *Rosneft's* core interests in this regard have not precluded it from becoming a corporate owner of entities associated with naval shipbuilding and repair. This is why *Rosneft* shipbuilding business is discussed in this report.

As its commercial and naval shipbuilding activities appear to be two sides of the same coin, they must be analysed together to better understand *Rosneft's* maritime activities. Unfortunately, it is somewhat harder to retrieve register data about the companies and entities that make up the *Rosneft* maritime conglomerate compared to USC entities. It seems that most of the *Rosneft*-affiliated entities involved were exempted from the mandatory disclosure rules of financial and company data sometime in the mid-2010s. Few usable register data can therefore be found after 2015 or 2016. For that reason, it has therefore been necessary here to rely extensively on recent secondary sources in order to piece together *Rosneft's* maritime corporate structures.

Starting with the source of finance for *Rosneft's* maritime adventures, the *Gazprombank*, it is Russia's third largest universal bank by assets. *Gazprombank* has also become known as a major lender to infrastructure and public-private partnership projects. It is in this latter capacity that it has gotten itself involved in some of the most talked about projects within Russia's shipbuilding sector. As its name indicates, the bank itself is controlled by the Russian gas giant, JSC *Gazprom*, although this control is distributed over several different entities. Together with one of its other subsidiaries, *Gazprom Capital*, Gazprom controls 49.87 per cent of the *Gazprombank*. *Gazprom*, in turn, is under the control of the Federal Agency for State Property Management, *Rosimushchestvo*. In August 2020, *Rosimushchestvo* controlled 38.37 per cent of *Gazprom* directly and another 10.97 per cent indirectly through JSC *Rosneftegaz*, a holding company in the energy sector, of which *Rosimushchestvo* is in full possession.[169]

Until May 2020, the above-mentioned *Rosimushchestvo* holding company *Rosneftegaz* also owned an absolute controlling stake in Russia's state oil company, *Rosneft*. It then sold parts of this package to the LLC *RN-NeftKapitalInvest*, which

[169] Gazprombank 2020.

is a subsidiary of *Rosneft*. After the transaction, *Rosneftegaz* still owned 40.4 per cent of *Rosneft* and *RN-NeftKapitalInvest* 9.6 per cent.[170]

The involvement of *Rosneft* and *Gazprombank* in the shipbuilding sector in Russia's Far East took on new momentum in 2013, when they set up a joint holding company, the *Modern Shipbuilding Technologies*,[171] MST, in which they were parity owners. In February 2017, it became known that the *Rosimushchestvo* holding, *Rosneftegaz*, had bought 89 per cent of the shares in the MST consortium, effectively establishing direct state control over the MST. In spite of these structural changes, MST is still considered to be a *Rosneft* entity. It is therefore likely that *Rosneft* is the only active owner taking all operative decisions, while *Rosimushchestvo* is content to determine the strategic direction through its instrument, *Rosneftegaz*.

This working order is also reflected in how the subsidiaries of MST are managed. MST has six subsidiaries; all are listed in Table 5.3. The most important of these are the FESRC, FEP *Zvezda* and SC *Zvezda*. Five subsidiaries are situated in the Primorskii krai and one in the city of Saint Petersburg. In two subsidiaries, the *SRZ-30 Ship Repair Yard* and the electrical engineering company *Vladivostok ERA*, the MST ownership share exceeds 75 per cent, which effectively eliminates any opportunity for blocking minorities to occur in these companies.

Table 5.3: Affiliated companies of Modern Shipbuilding Technologies[172]

Name	City	Sub-industry	Field of interest	Type of work
Far Eastern Shipbuilding and Ship Repair Centre, FESRC	Vladivostok	Shipb. & rep.	Corporate management; Submarines (D/E, N); Surface ships	Holding company; Shipbuilding; Modernisation; Maint. & rep.
Far Eastern Plant Zvezda, FEP Zvezda	Bolshoi Kamen	Shipb. & rep.	Subm (D/E, N); Surface ships	Repair yard
Shipyard Complex Zvezda, SC Zvezda	Bolshoi Kamen	Shipb. & rep.	Large surface ships; Offshore structures	Shipyard
SRZ-30	Dunai, Fokino	Shipb. & rep.	Subm (D/E, N); Surface ships; Docks	Repair yard; Dock rep.; Displ.
VC ERA	Vladivostok	Electr. engr.	Electr. install. & adjustm.	Manufacture; Installation work
CCB Iceberg	St. Petersburg	Shipb. & rep.	Icebreakers; Naval auxiliary special ships	Design & constr.

Remarks: Subm, submarines; D/E, diesel-electric. N, nuclear. Shipb. & rep., shipbuilding and repair. Engr., engineering. Displ., disposal.

[170] *Interfax* 2020a.

[171] In Russian: *Sovremennye tekhnologii sudostroeniia*, STS.

[172] Author's compilation of data from various Russian databases.

In 2015, and by virtue of a presidential decree, MST bought a majority stake in the *Far Eastern Shipbuilding and Ship Repair Centre*,[173] FESRC, from the USC. According to the latest published data, from 2016, the MST has since then controlled 75 per cent of the FESRC stock minus two shares. The USC has so far retained a blocking package of 25 per cent plus one share. The last share is directly owned by the state.[174] Thus, MST is clearly in control of FESRC, although some strategic decisions might still be blocked by the minority shareholders. Despite the formal structure, however, leading management positions, including the post of general director, are regularly occupied by people originating from top positions within the *Rosneft* sphere. Operative management of FESRC so far thus remains with *Rosneft*.

MST ownership in FESRC also automatically brought it to take control over the *Far Eastern Plant Zvezda*,[175] FEP *Zvezda*, in Bolshoi Kamen, a town adjacent to Vladivostok, in the Primorskii krai, in the far eastern part of Russia. FEP *Zvezda* is the leading enterprise for repairing submarines of the Russian Pacific Fleet, and the only company in the Far East specialising in repair, re-equipment and modernisation of nuclear submarine missile carriers. It also builds commercial surface ships. At present, MST owns 53.51 per cent of FEP *Zvezda*, and FESRC the remaining 46.49 per cent, of this previous USC-company.

Parts of FEP *Zvezda* territory and facilities in Bolshoi Kamen had previously been set aside to realise what is now known as the *Zvezda shipyard complex*. This is a prior USC project initially set up in 2009 to strengthen and modernise Russia's civilian and naval shipbuilding capacity in the Far East. It is Russia's first shipyard of its kind for large-scale ship construction, since the former Soviet shipyards for large-scale construction ended up under the jurisdiction of Ukraine when the Soviet Union split up. The project was subsequently transferred to the *Rosneft* sphere, after significant delays and several setbacks under the USC management.

In 2015, the project was organised as the LLC *Shipyard Complex Zvezda*,[176] SC *Zvezda*. Since October 2017, MST is the sole owner of SC *Zvezda*, and FESRC is its project manager and operator.[177] Fully developed in 2024, according to the time schedule, SC *Zvezda* will be designed and equipped for construction of all types of sea-going vessels with a deadweight up to 350,000 tonnes and for production platforms for the Russian continental shelf. Its lifting capacity is probably also unique for Russia, including two gantry cranes with a lifting capacity of 1200 tonnes each. *Rosneft* has guaranteed a pilot base load of 28 ships, including

[173] In Russian: *Dalnevostochnyi tsentr sudostroeniia,* DTsSS.

[174] Dalnevostochnyi tsentr sudostroeniia i sudoremonta 2016.

[175] In Russian: *Dalnevostochnyi zavod Zvezda.*

[176] In Russian: *OOO Sudostroitelnyi kompleks Zvezda*, SSK Zvezda.

[177] Federalnaia nalogovaia sluzhba 2021c.

twelve Arc 6 or Arc 7 ice-class tankers, according to the Russian ice-class classification system.[178] In October 2020, SC *Zvezda* began construction of a seventh Aframax tanker, out of a series of 12 ships. Overall, its order portfolio then amounted to over 50 ships, with an option of a further 59 ships.[179]

The latest addition to the MST corporate structure is the *Central Construction Bureau Iceberg*, in Saint Petersburg, which it bought from the *Krylov* Centre in October 2020, by presidential decree. The CCB *Iceberg* is the only construction bureau in Russia specialising in construction of ice-classed ships and maritime structures. After the deal, MST controls 64.12 per cent and USC 32.65 per cent of the voting shares in CCB *Iceberg*.

The transfer of CCB *Iceberg* from the *Krylov* Centre to MST suggests a likely relocation of Russia's competence in design and construction of ice-classed ships, vessels and maritime structures from Saint Petersburg, Severodvinsk and Murmansk to the Far Eastern District. The most specific step taken in this direction is the decision to let SC *Zvezda* build the huge new Project 10510 *Lider*-class nuclear icebreakers, instead of the Baltic shipyard or the *Admiralteiskie verfi*, which was already mentioned in Section 3.3. The Project 10510 lead ship, the *Rossiia*, will be the first ship of its kind with a projected propulsion power of 110 MW, eventually to be followed by two sister ships, in 2031 and 2035.[180]

In September 2016, Russia's Naval Forces also contracted SC *Zvezda* to build a large floating dock, Project 23380. According to *Bmpd*, the unofficial blog of the Centre for Analysis of Strategies and Technologies (CAST), a Russian think tank for matters related to Russia's defence industrial complex and arms trade, this dock is being built to ensure the basing in Viliuchinsk of Project 955 Borei-class strategic nuclear submarine missile cruisers.[181] There is thus a clear interest in the SC *Zvezda* from Russia's naval forces in the Far East, as well.

However, apart from SC *Zvezda*, much of the corporate value of the MST–*Rosneft* shipbuilding conglomerate in Russia's Far Eastern District still relates to FESRC. Besides its minority share in FEP *Zvezda*, which was mentioned above, FESRC is a holding company in its own capacity, and four of its subsidiaries appeared in the 2015 List of Organisations included in the Consolidated Register of the Defence Industrial Complex. They are listed in Table 5.4. In each of these entities, FESRC has an absolute controlling stake of at least 99.99 per cent, but less than 100 per cent, of the shares, according to the List of Affiliated Persons for each of these entities.

[178] Rosneft 2018.

[179] SC Zvezda 2020?; SC Zvezda 2020; Rosneft 2020.

[180] *Interfax* 2020b; *Interfax* 2020c.

[181] Bmpd.livejournal.com 2016.

Two of the companies in Table 5.4 are located in Vladivostok, in Primorskii krai; one is in Khabarovsk, Khabarovskii krai, and one in Vyliuchinsk, Kamchatskii krai. By name, all four are ship repair yards, but in reality, only three of them appear to be. The *SRZ-179* is today the only enterprise in the Far East Region that repairs high-speed diesel ship engines. The *Dalzavod Ship Repair Centre*,[182] DSRC, is the main repair base for surface ships and diesel-electric submarines in the Russian Pacific Fleet, and is based on the *SRZ-178 Dalzavod* and the *SRZ-92*.[183] The North-Eastern Repair Centre,[184] NERC, is the only company in the Kamchatka region engaged in ship repair of naval surface ships and submarines.

Table 5.4: Affiliated companies of the Far Eastern Shipbuilding and Ship-Repairing Centre, FESRC[185]

Name	City	Sub-industry	Field of interest	Type of work
SRZ-179	Khabarovsk	Ship engr.	Diesel engines	Maint. & repair
Dalzavod Ship Repair Centre, DSRC	Vladivostok	Shipb. & rep.	Submarines (D/E); Surface ships	Ship repair
SRZ-92	Vladivostok	Shipb. & rep.	Surface ships	Ship repair
North-Eastern Repair Centre, NERC	Viliuchinsk	Shipb. & rep.	Submarines (D/E, N); Surface ships	Ship repair; Disposal

Remarks: D/E, diesel-electric. N, nuclear.

According to its company information, FESRC also claims to be the single executive body for several of the MST-controlled companies listed in Table 5.3. Moreover, in some of its information material it also claims to be the executive body for SRZ-82.[186] This is startling, as this ship repair yard is located in the Murmansk region, and because its formal owner is the LLC *RN-Active*, which is a holding company within another part of the *Rosneft* sphere, completely separated from MST.

Regardless of the exact nature of FESRC's claims, MST, *Rosneft*—and behind them the Russian leadership—have turned FESRC into a powerful tool to develop and modernise the shipbuilding infrastructure in Russia's Far Eastern Region. Repair and maintenance of the ships and vessels of the Russian Pacific Fleet remains an absolute priority, which has led to the establishment of the *Dalzavod Ship Repair Centre* and upgrading and reconstruction of the *North-Eastern Repair Centre* and FEP *Zvezda*.

In parallel, the implementation of the *Zvezda Shipyard Complex* aims to establish a shipbuilding business cluster in the Russian Far East, with the complex as its

[182] In Russian: *Tsentr sudoremonta Dalzavod*, OAO TsSD.

[183] FESRC 2020?b.

[184] In Russian: *Severo-Vostochnyi remontnyi tsentr*, AO SVRTs.

[185] Author's compilation of data from various Russian databases.

[186] FESRC 2020?c.

anchor project.[187] Although the project management under the supervision of FESRC and MST appears to be running more or less according to plan, the ultimate success or failure of the project is not entirely in Russian hands. The SC *Zvezda* will be very much subjugated to the global conjunctures of global shipbuilding. Successes and failures will largely depend on its strategic choice of establishing itself in the upper or lower end of the market and the exact competition it will meet from the large shipbuilders of the world.

Other companies within the shipbuilding and ship repair segment

Besides the USC and *Rosneft* shipbuilding conglomerates, there is an additional group of fifteen companies with heterogeneous and more randomly generated affiliations. These entities are listed in Table 5.5.

Table 5.5: Other companies within the shipbuilding and ship repair segment[188]

Name	City	Subsector	Field of interest	Type of work
TsKB PO SPK im. R.E.Alekseeva	Nizh. Novgorod	Shipb. & rep.	Hydrofoil vessels & Ekranoplanes	Design & constr.
TsKB Monolit	Gorodets	Shipb. & rep.	Vessels with reinforced concrete hulls	Design & constr.
IaSZ	Iaroslavl	Shipb. & rep.	Surface ships; Auxiliary ships; Special ships; Offshore tug boats	Design & constr.; Shipyard
SZ Vympel	Rybinsk	Shipb. & rep.	Surface ships; Special ships	Shipyard
Vostochnaia verf	Vladivostok	Shipb. & rep.	Surface ships	Shipyard
Zelenodolskii zavod imeni A.M. Gorkogo	Zelenodolsk	Shipb. & rep.	Surface ships	Shipyard
Leningradskii SZ Pella	Otradnoe	Shipb. & rep.	Surface ships; Tug boats	Shipyard
OOO SZ Zaliv	Kerch	Shipb. & rep.	Surface ships	Shipyard
Sokolskaia sudoverf	Sokolskoe	Shipb. & rep.	Surface ships; Auxiliary ships; Special ships	Shipyard
SSK	Gorodets	Shipb. & rep.	Auxiliary ships; Special ships; Berths	Shipyard
SF Almaz	St. Petersburg	Shipb. & rep.	Surface ships	Shipyard
SZ Volga	Nizh. Novgorod	Shipb. & rep.	Special ships	Shipyard
SZOR	Blagoveshchensk	Shipb. & rep.	Surface ships	Shipyard
Sretenskii SZ	Kokui	Shipb. & rep.	Surface ships	Shipyard
PKF Mnev i K	St. Petersburg	Shipb. & rep.	Rigid-hull inflatable boats	Factory

Half of these entities are owned by physical persons; in some cases, the owner structure reveals that it is a purely family business. The other half is owned by what appears to be various investment companies. As many of these investment companies are organised as LLCs or as non-public JSCs, it is sometimes difficult

[187] FESRC 2020?b.

[188] Author's compilation of data from various Russian databases.

to trace the real owners, as neither LLCs nor non-public JSCs are obliged to publish any lists over their affiliated persons.

The shipbuilding firm *Almaz* appears to be implicitly related to the USC *Central Construction Bureau Almaz*, as the construction bureau has included the shipbuilding firm in its own company information on the Internet. However, formal ownership of the *Almaz* shipbuilding firm is shared between two LLCs; it has not been possible here to prove their eventual affiliations with the *Almaz* construction bureau.

The SZ *Vympel* formally belongs to the two LLCs, *TKKh-Invest* and *TKKh-Grupp*, which are parts of the financial superstructure of the *Kalashnikov* sphere. The *Kalashnikov* concern manages SZ *Vympel* in practice.

The *Zelenodolskii zavod imeni A.M. Gorkogo* is a previous USC company that is known for its small missile ships, such as Projects 22800 and 21631. It became the core of the shipbuilding corporation AK *Bars* when it was established in 2018, as a subsidiary to the AK *Bars Holding Company*.[189] The general director of AK *Bars Holding Company* is the Tatarstani businessman and politician Ivan Egorov. The main owner of the holding company is the LLC *Investitsii i Konsalting*, which has controlled 29.685 per cent of the share capital since 2017.[190] This entity, in turn, is controlled by another LLC, the financial corporation *Timerkhan*.[191] Finally, *Timerkhan* belongs to the above-mentioned Ivan Egorov, who has contributed 2.16 billion roubles, or 99.9995 per cent of the initial capital of 2.16001 billion roubles.[192]

The LLC *Zaliv shipyard*, in Kerch, in Crimea, was set up adjacent in time to Russian occupation of the peninsula in 2014. After its registration, the so-called Crimean self-defence forces were brought into play to take over the Ukrainian JSC *Zaliv Shipyard* by force, and to transfer its assets to the new LLC. The ownership structure behind the LLC is nebulous but not entirely impenetrable; it has therefore become an open secret that it was the *Zelenodolskii zavod* that was behind the takeover, and behind it, AK *Bars*.[193] AK *Bars* has also been involved in other takeovers within the marine instrumentation segment in the Crimean Peninsula. These takeovers are further discussed in this chapter in the section on the marine instrumentation segment.

[189] Flotprom 2020.

[190] Kholdingovaia kompaniia Ak Bars 2019.

[191] Federalnaia nalogovaia sluzhba 2021i.

[192] Federalnaia nalogovaia sluzhba 2021j.

[193] Latypov 2019.

5.2 The marine instrumentation segment

The marine instrumentation subsector is mainly represented by five state-controlled instrument-making corporations, *Concern Morinformsystem–Agat, Avrora*, *Okeanpribor*, *Granit-Elektron*, and *Elektropribor*. Taken together with their subsidiaries, they represent almost 78 per cent of the total number of companies within the sector.

A common trait for these corporations is that they appear to be more secretive than most other companies in the segment are. A breaking point in this regard appears to have been 2016, give or take some years in specific cases. At that time, several companies stopped publishing financial and company information, in compliance with the above-mentioned regulation, 454-P, of the Central Bank of Russia. This new order of things might have had to do with the corporate restructuring that took place within the marine instrumentation segment in the mid-2010s, which may have given the companies an opportunity to request exemptions from the otherwise mandatory legislation. A few companies outside this core structure of the marine instrumentation segment have followed suit, but the majority still disclose their information on a more or less regular basis.

Concern Okeanpribor

The *Concern Okeanpribor* was created in March 2006, when the FSUE Central Research Institute *Morfizpribor*[194] was transformed into the public JSC *Concern Okeanpribor*, in accordance with Presidential Decree Number 132, from 3 February 2004. The purpose of this reorganisation was to preserve and concentrate the scientific, technological and production potential of hydroacoustic enterprises in order to use it more effectively when implementing programmes for creating hydroacoustic systems and complexes.[195] The same presidential decree also provided for the creation of an integrated structure by transferring the controlling stakes in seven other hydroacoustic enterprises to the *Concern Okeanpribor*. Two additional entities were transferred to the concern structure in 2012. Two years later, one of the original companies was completely merged with one of the two latest additions.

The current number of subsidiaries of *Concern Okeanpribor* thus amounts to eight entities, which are all listed in Table 5.7. Four of these are located in Saint Petersburg, two are in Volgograd and the last two are in Taganrog and Severodvinsk, respectively. The concern also has a branch in Karelia, in the form of a test site

[194] In Russian: *Tsentralnyi nauchno-issledovatelskii institut Morfizpribor*.

[195] Okeanpribor 20??a.

adjacent to Lake Ladoga. This place has not been chosen accidentally, as the bottom of the lake is covered with a layer of silt up to 18 meters thick, which is a good sound absorber.[196] There is also another branch in Kirovsk.

Table 5.6: Affiliated companies of Kontsern Okeanpribor[197]

Name	City	Subsector	Field of interest	Type of work
NII Briz	St. Petersburg	Marit. instr.	Hydroacoustics	R&D
NII gidrosviazi Shtil	Volgograd	Marit. instr.	Hydroacoustic communications	R&D
Taganrogskii zavod Priboi	Taganrog	Marit. instr.	Hydroacoustic systems	R&D; Design & constr.; Instr. making
NPP Raduga	St. Petersburg	Marit. instr.	Digital image processing devices	R&D; Manufacture
Vodtranspribor	St. Petersburg	Marit. instr.	Hydroacoustic antennas	Instr. making
Vodtranspribor-Pusk	St. Petersburg	Marit. instr.	Hydroacoustic antennas	Installation work
Severnyi Reid 2012	Severodvinsk	Marit. instr.	Hydroacoustics, navigation complexes, systems automation	Manufacture
PK Akhtuba	Volgograd	Marit. instr.	Hydroacoustic systems; Navigation complexes; Underwater communication	Manufacture; Installation work; Maint. & repair

Open access company information about the *Concern Okeanpribor* is scarce and hard to come by, since the concern from 2014 onwards has been explicitly released from the obligation to disclose its financial and other corporate information, as requested by Regulation number 454-P of the Central Bank of Russia.[198] According to its last public annual report, published in 2015, the concern is the leading company in the creation of hydroacoustic weapons for the Navy and hydroacoustic devices for civilian purposes. Among its main areas of activity are development, production, modernisation and maintenance of hydroacoustic equipment for the Navy and civilian fleets of Russia; research in the field of applied hydroacoustics; testing of sonar technology; and research to increase the efficiency of hydroacoustic equipment. According to its own estimation, in 2014 the share of the *Concern Okeanpribor* in the Russian market for hydroacoustics amounted to approximately 70 per cent, on average. Within specific areas, it was even a monopolist.[199]

In spite of its central role and key position within the marine instrumentation segment, *Okeanpribor* has nevertheless been dependent on and taken advantage of the special sectoral industrial programmes that the Ministry of Industry and Trade has been implementing under the last two decades. Thanks to these programmes, the

[196] Okeanpribor 20??b.

[197] Author's compilation of data from various Russian databases.

[198] Okeanpribor 20??c.

[199] Okeanpribor 2015:36–37.

concern has been able to re-equip its production facilities significantly, and to develop its scientific-technical and testing facilities, of which it might now take advantage.[200]

Concern Morinformsystem–Agat

The *Concern Morinformsystem–Agat*,[201] or, for short, *Morinsys–Agat*, is the legal successor to the previous federal state unitary enterprise, FSUE, with a similar name. It was incorporated in 2006 by order of the Federal Agency for State Property Management, *Rosimushchestvo*, based on Presidential Decree Number 134, from 3 February 2004. A series of subsequent presidential decrees has since then continued to shape the internal structure of the concern. Pursuant to its annual report for 2019, *Morinsys–Agat* is a shareholder in 16 companies. In eight of these entities, it controls all shares minus one; the last share belongs to the state. Yet, in at least five companies, this last share has been transferred to *Morinsys–Agat* for trust management. In another five companies, *Morinsys–Agat* is the majority shareowner, although the ownership structure in two of these allows for the formation of blocking minorities. In two other companies, it is able to form a blocking minority. In the last company, it has so far taken a minority post, which corresponds to just over 6 per cent of the total share capital.[202]

Twelve of the companies in which *Morinsys–Agat* is a shareholder were registered in the 2015 List of Organisations included in the Consolidated Register of the Defence Industrial Complex, and are listed in Table 5.7. Given the domination of military products for the entire concern, it cannot be excluded that the remaining four companies might have been added to the register after 2015.

Concern Morinsys–Agat is based in Moscow, as are most of its subsidiaries, if they are not located in one of the surrounding satellite cities of Moscow, as demonstrated by Table 5.7. Two entities are located in the Volga district and one company in Vladivostok, in the Far Eastern district.

Combined with its subsidiaries, *Morinsys–Agat* covers the entire production chain for several informational systems and technologies, from research and development, design and construction, manufacture, installation and wiring, to commissioning and maintenance and repair. Moreover, the *Scientific Production Company Taifun* in Kaluga has its own subsidiary, *Radar-servis*, which is involved in installation, commissioning, maintenance and repair work of shipborne radars.

According to its company information, the prior *Scientific Production Association Agat* constitutes the core of the concern. For more than 60 years, it has developed

[200] Korotchenko 2020.

[201] In Russian: *Kontsern Morinformsistema – Agat* or *Kontsern Morinsis – Agat*.

[202] Kontsern Morinformsistema – Agat 2020.

and produced automated systems and complexes for controlling the combat activities of submarines and surface ships, as well as other types of ship weapons. The concern is described as an umbrella organisation specialising in information systems and technologies, system engineering related to marine data computing equipment, electromagnetic compatibility of radio-electronic facilities, degaussing systems, and fire control systems of sea-based cruise and ballistic missiles, as well as combat information and control systems, including integrated systems for surface ships and submarines. All companies within the concern have their own field of activities and appear to master several links in the production chain, from research and development to manufacture.[203] According to the Russian business-oriented newspaper, *Kommersant*, *Morinformsystem–Agat* combines enterprises that create integrated combat information and control systems for ships, radar navigation systems and control of artillery and missile systems.[204]

Table 5.7: Affiliated companies to Concern Morinformsystem –Agat[205]

Name	City	Subsector	Field of interest	Type of work
AKIN	Moscow	Marit. instr.	Hydroacoustics	R&D
TsNII Kurs	Moscow	Marit. instr.	Radio navigation systems; On-board ctrl systems	R&D
NII Atoll	Dubna	Marit. instr.	Positional hydroacoustic systems	R&D
NPP Saliut	Moscow	Marit. instr.	Shipborne radar systems	R&D
NPP KPSZ Taifun	Kaluga	Marit. instr.	Shipborne radar systems	R&D; Manufacture
NPF Meridian	St. Petersburg	Electr. engr	Systems automation; Combat management systems; Degaussing systems	R&D; Manufacture
KB Ametist	Moscow	Armament	Naval artillery complexes; Artillery radar ctrl systs Navigation devices	Design & constr.
Izumrud	Vladivostok	Armament	Systems automation; Combat management systems; Artillery & missile ctrl systs	Design & constr. Manufacture; Maint. & rep.
FNPTs Mars	Ulianovsk	Marit. instr.	Integrated automated ctrl systs; Printed circuit boards & electronic modules	Manufacture
Kometa	Ulianovsk	Marit. instr.	Digital computing systems	Manufacture
PO Binom	Saratov	Marit. instr.	Naval computing systems	Manufacture
Zavod Topaz	Moscow	Marit. instr.	Artillery radar ctrl systs	Manufacture; Maint. & rep.; Installation work

[203] Concern Morinformsystem–Agat 2018?;
Kontsern Morinformsistema – Agat 2020:32, 74–79.

[204] Vedeneeva 2019.

[205] Author's compilation of data from various Russian databases.

The concern is highly specialised towards special equipment, a code word for equipment with mostly military use. Sales of special equipment amounted to 18,300 million roubles in 2019, higher than in previous years, which corresponded to 95 per cent of total sales. The bulk of sales went directly to the Russian Navy through the Ministry of Defence, or through the top system integrators fullfilling the State Defence Order, GOZ. Sales of civilian and general production amounted to 973 million roubles in 2019. The market share of *Morinsys–Agat* within the civilian market niches it tries to exploit amounts to less than one per cent, on average.[206]

NPO Avrora

The JSC *Concern Avrora Scientific and Production Association*[207], in Saint Peters-burg, was registered in February 2009 and is the legal descendant of the FSUE with the same name. The corporatisation of *Avrora* was carried out in accordance with Presidential Decree number 399, from 21 March 2007. Simultaneously, the state transferred its shares in the *Neptune* factory in Stavropol to *Avrora*, thus creating a vertically integrated structure.[208] Until 31 December 2020, *Avrora* had acquired 59.56 per cent of the ordinary shares in *Neptune*; there is no information about the distribution of the remaining shares.[209] On 25 January 2021, the concern also obtained 50 per cent of the common shares in the *Zavod Ladoga*, a factory for manufacture of electronic devices, in Kirovsk, Leningrad district, from two LLCs.[210] Both entities are listed in Table 5.8.

Table 5.8: Affiliated companies of Concern Avrora[211]

Name	City	Subsector	Field of interest	Type of work
Neptune	Stavropol	Marit. instr.	Automatic ship ctrl. systems	Design & constr.; Manufacture
Zavod Ladoga	Kirovsk	Marit. instr.	Radio-electronic devices	Manufacture

In addition, *Concern Avrora* has a number of independent or separate subdivisions and representative offices. They are located in Gadzhievo, Novorossiisk, Kaliningrad, and Severodvinsk, as well as abroad in countries that are major consumers of its products—at present, India and Vietnam. The purpose of these entities is to provide for in site repair and operational maintenance for its products.[212]

[206] Kontsern Morinformsistema – Agat 2020:35–36.

[207] In Russian: *Kontsern Nauchno-proizvodstvennoe obedinenie Avrora*.

[208] NPO Avrora 2020.

[209] Neptun 2021.

[210] Zavod Ladoga 2021.

[211] Author's compilation of data from various Russian databases.

[212] NPO Avrora 2020.

Concern Avrora is another of the leading instrument-making enterprises of the shipbuilding industry in Russia. According to Kommersant, *Avrora* develops and manufactures combat information and control systems for large and small combat ships, as well as control systems for nuclear power plants.[213] Its company information pinpoints that, among other things, its business orientation is development and manufacture of integrated systems for automated control of technical facilities of maritime and river objects.[214]

Furthermore, within the military field, *Concern Avrora* develops and builds decentralised network control systems, comprising an integrated bridge system, general ship data exchange system and integrated hardware control system intended for surface ships. As for submarines, three different controlling systems developed by *Concern Avrora* are currently in use to manage different submarine technical systems. Another of its products is an automated information and combat control system for diesel-electric submarines. It also develops and builds crew workspaces adapted for military use.[215]

State Research Centre Concern Elektropribor

The JSC *State Research Centre Concern Elektropribor*[216] came about in 2008, due to another FSUE reorganisation, this one in accordance with Presidential Decree Number 400, from 21 March 2007. The concern has its main office in Saint Petersburg and two branch offices in the Leningrad region, Gatchina and Lebiazhe, and one in Moscow.[217] It also has three daughter companies in Kaspiisk, in the North Caucasian District, in Cheliabinsk, in the Ural District, and in Barnaul, in the Siberian District. The daughter companies are listed in Table 5.9.

Table 5.9: Affiliated companies of Kontsern TsNII Elektropribor[218]

Name	City	Subsector	Field of interest	Type of work
APZ Rotor	Barnaul	Marit. instr.	Navigation devices	Instr. making
KZTM	Kaspiisk	Marit. instr.	Navigation devices; Power supply systems; Ctrl systems	Instr. making; Maint. & repair
Zavod Pribor	Cheliabinsk	Marit. instr.	Pressure control devices	Design & constr.; Instr. making

[213] Vedeneeva 2019.

[214] Concern Avrora 20??a.

[215] Concern Avrora 20??b.

[216] In Russian: *Kontsern tsentralnyi nauchno-issledovatelskii institut Elektropribor*.

[217] Federalnaia nalogovaia sluzhba 2021k.

[218] Author's compilation of data from various Russian databases.

The main business orientation of *Concern Elektropribor* is likewise determined by the above-mentioned Presidential Decree number 400 and established in the company charter. The concern is the leading enterprise in Russia in the field of development and manufacture of high-precision navigation, orientation and stabilisation systems; gyroscopy; gravimetric systems; and optoelectronic periscope systems. It also produces precision astronomic-geodetic systems, and develops and supplies equipment for marine radio communication and hydroacoustics. *Concern Elektropribor* also conducts research and development in hydroacoustics, integrated situational awareness systems, optoelectronics and maritime radio communication.[219] It is also somewhat involved in the space industry, developing and constructing spacecraft micro-acceleration measuring systems and orientation systems, and in mining, making devices and systems for underground navigation for borehole drilling and monitoring.[220] Within its working areas, the concern masters all steps in the production cycle, from fundamental research to production and after-sales maintenance of products in use.

In 2019, 74.3 per cent of the company's work volume was related to the state defence order. Technical cooperation with foreign customers and exports amounted to another 21.9 per cent, and civilian production constituted the remaining 3.8 per cent of the total volume of work.[221]

The production of *Concern Elektropribor* is strategically important. Its dominating, sometimes even monopoly position within different submarkets implies that *Elektropribor* is a strategic asset within the Russian defence industrial complex.

The Marine Instrument Engineering Corporation

The above review of four of the five core companies within the marine instrumentation segment demonstrates that the transition from federal state unitary enterprises and incorporation of the major entities into joint stock companies took place in two rounds. The first round began with the presidential decrees of February 2004 and resulted in the incorporation of *Morinformsystem–Agat* and *Okeanpribor* in February and March 2006. Likewise, the second round began with the presidential decrees of March 2007, initiating the incorporations of *Elektropribor* and *Avrora*, which was accomplished by their incorporation in late February 2009.

President Putin initiated a third round of consolidation of the segment in April 2020, with Presidential Decree Number 235, establishing a *JSC Marine Instrument Engineering Corporation*[222] and locating its head office in Saint Petersburg.[223]

[219] TsNII Elektropribor 2020:2, 44.

[220] Elektropribor 2018?.

[221] TsNII Elektropribor 2020:46.

[222] In Russian: *Korporatsiia morskogo sudostroeniia,* KMP.

[223] Prezident Rossiiskoi Federatsii 2020.

This decree was followed up by a Governmental Decree, in May 2020 that provided more detailed content and instructions to all involved authorities. The final step took place on 22 December 2020, when the new corporation received its state registration. So far, as of spring 2021, it has remained entirely under state control.[224]

In conjunction with the registration of the *Marine Instrument Engineering Corporation*, all shares minus one in each of *Morinformsystem–Agat*, *Okeanpribor*, *Elektropribor*, and *Avrora* were transferred to the new corporation as the main part of its share capital. The remaining part of its share capital is made up of an additional 200 million roubles and one share each from another sixteen companies—most of which are already subsidiaries to *Morinformsystem–Agat*, *Okeanpribor*, *Elektropribor*, or *Avrora*.

The original proposal to set up the *Marine Instrument Engineering Corporation* came from the Ministry of Industry and Trade in October 2019. In addition, the Ministry also drafted the initial presidential decree. The merger of the original four corporations into a single new entity aims to solve the problem of the overlapping of some of the core competencies within the marine instrumentation segment as well as duplication of products.[225] Another motive for the formation of the new concern, as noted by the Ministry, is based on the specifics of the shipbuilding industry. These include the following: the nomenclature for the element base is made up of more than fifty thousand elements; the cycle of changing the element base is about three years; there is a long production cycle; and the main elements are in a state of constant modernisation and refinement, due to the customer requirements.[226]

According to Andrei Shatokhin, general director of *Okeanpribor*, the creation of the *Marine Instrument Engineering Corporation* is a natural step that follows the path already taken by leading European manufacturers of similar systems. While the merger is as difficult as any other radical restructuring, the potential long-term result is a significant increase in the efficiency of the enterprises within the holding and, hence, an increase in the quality and competitiveness of their products.[227]

The post as head of the new corporation went to Leonid Strugov. This is an interesting choice, as it illustrates how informal management connections beyond formal ownership structures play a role in Russia's strategic management of its defence industrial complex. In 2008–2014, Strugov worked as director of the Department of the Shipbuilding industry and maritime engineering at the Ministry of In-

[224] Pravitelstvo Rossiiskoi Federatsii 2020; Federalnaia nalogovaia sluzhba 2021d.

[225] *Fontanka* 2020; Ministerstvo promyshlennosti i torgovli Rossiiskoi Federatsii 2019.

[226] *Portnews* 2020; Ministerstvo promyshlennosti i torgovli Rossiiskoi Federatsii 2019.

[227] Korotchenko 2020.

dustry and Trade. He was then appointed first vice-president within the USC conglomerate in December 2014, a post he still held in spring 2021, in spite of his new position.[228]

Strugov's background carries two important implications. First, due to his years at the Ministry of Industry and Trade, he has an insider's understanding of the comprehensive strategic industrial development goals set by the highest political levels of the Russian government. Second, the reason why Strugov has not had to trade his position within USC in exchange for his new appointment is probably that he is expected to act as a middleman between the two corporations. By keeping his post within the USC, Strugov is in a unique position to coordinate and plan for research and development as well as manufacturing at the Marine Instrument Engineering Corporation in such a way that it fits in with USC shipbuilding and ship repair production plans.

The Concern Granit-Electron

The final major corporation within the marine instrumentation segment is the *Concern Granit-Electron*.[229] In contrast to the other major concerns, it has so far followed a somewhat different trajectory, with a separate timeline. It was not included in the original group of enterprises that were transferred to the new Marine Instrument Engineering Corporation in December 2020.

Based on previous decrees from the Russian government, the FSUE *Granit* was incorporated and registered as a JSC on 18 May 2006, by an order dated 18 May 2005, from the Federal Agency for State Property Management, *Rosimushchestvo*.[230] The only information that this study found to suggest that there was also a presidential decree behind the government decrees indicates that the possible signing of such a document was in October 2002, at the earliest.[231]

The current structure of the corporation, with subsidiaries, began to take form on 21 March 2007, with Presidential Decree Number 398.[232] All six subsidiaries are listed in the 2015 List of Organisations included in the Consolidated Register of the Defence Industrial Complex and are shown in Table 5.10. Four subsidiaries are located in Saint Petersburg; the remaining two are manufacturing entities located in the Saratov region, in the Volga district.

The corporation remained under the direct control of the Federal Agency for State Property Management, *Rosimushchestvo*, until 16 January 2019. By virtue of the

[228] *RBK* 2020; *USC* 2021e; Vedeneeva 2020c.

[229] In Russian: *Kontsern Granit-Elektron*.

[230] Kontsern Granit-Elektron 2015:21–22.

[231] Delovoi Peterburg 2002.

[232] Prezident Rossiiskoi Federatsii 2007.

Presidential Decree number 63 issued in February 2018, the entire share capital of *Granit-Electron* minus one share was then transferred to the state-controlled JSC *Tactical Missiles Corporation*,[233] a major Russian weapons manufacturer that is particularly specialising in the production of missiles.[234]

Table 5.10: Affiliated companies of Concern Granit-Electron[235]

Name	City	Subsector	Field of interest	Type of work
Zavod im. A.A.Kulakova	St. Petersburg	Marit. instr.	Low-current equip.; Autonom. monit. syst. ship comm.; Special-purpose systems	Design & constr.; Instr. making
Ravenstvo	St. Petersburg	Marit. instr.	Radio-electronic systems; Navigation support	Instr. making
Severnyi Press	St. Petersburg	Marit. instr.	On-board ctrl systs ASCMs	Design & constr.; Instr. making
Ravenstvo-Servis	St. Petersburg	Marit. instr.	Fire ctrl systs antisubmarine & antitorpedo arms; C2 EW systems	Installation. work Maint. & repair
Saratov Radio Instrumentation Plant	Saratov	Marit. instr.	Radio-electronic systems; Target designation	Manufacture
Petrovskii elektromekhanicheskii zavod Molot	Petrovsk	Marit. instr.	Fire ctrl systs; Aut. combat ctrl systs; Naval forces training systs	Manufacture

Remarks: Autonom. monit. syst. ship comm., autonomous monitoring system for ship communication. ASCM, anti-ship cruise missile. C2, command and control. EW, electronic warfare.

The *Concern Granit-Electron* is a so-called scientific manufacture company;[236] it presents itself as one of Russia's major forefront R&D and original equipment manufacturers (OEMs), producing radio-electronic warfare systems and information management systems on behalf of the Naval Forces. It has federal status, and like many other entities within the shipbuilding sector, it has been included in the Rusian list of national strategic and systematically important enterprises.[237]

The history of Concern *Granit-Electron* extends over a hundred years. It plays a central role in furnishing Russia's naval surface ships and submarines with radio-electronic equipment. It profiles itself as a technological frontline company, and it has invested in new industrial technologies for competitive high-tech systems production.[238] Still, the concern has had its share of economic hardship. In particular, the two companies in the Saratov region have had recurring financial deficits in the 2010s, leading to heavy indebtedness. The transfer of the entire *Granit-Electron* to the larger *Tactical Missiles Corporation* might in part have been motivated

[233] In Russian: *Korporatsiia Takticheskoe raketnoe vooruzhenie*, KTRV.

[234] *Concern Granit-Electron* 2017; Prezident Rossiiskoi Federatsii 2018.

[235] Author's compilation of data from various Russian databases.

[236] In Russian: *Nauchno-proizvodstvennoe predpriiatie.*

[237] *Concern Granit-Electron* 2017.

[238] Novichkov and Fediushko 2020a; *Concern Granit-Electron* 2017.

as an attempt to find a long-term solution to this situation. In an inteview in early 2021, the general director of the *Tactical Missiles Corporation*, Boris Obnosov, nevertheless confirmed that the corporation had used corporate policy to settle debts at the *Saratov Radio Instrumentation Plant* amounting to 1.5 billion roubles.[239]

Other companies within the marine instrumentation segment

Besides the major state-controlled instrument-making corporations and their subsidiaries, there are nine other entities, listed in Table 5.11, that fall outside this core structure. At least four of these are owned solely by physical persons; some others involve LLCs as owners that, occasionally, have a surprisingly low funding capital. In many cases, the real owners seem to be local businessmen with multitudinous business interests in different branches; their business empires look like they have been built more around temporary business opportunities than being founded on an overall strategic plan.

Table 5.11: Other companies within the marine instrumentation segment[240]

Name	City	Subsector	Field of interest	Type of work
MNS	St. Petersburg	Marit. instr.	Navigation devices	Instr. making
Dalpribor	Vladivostok	Marit. instr.	Radio; Hydroacoustics	Design & constr.; Instr. making
Zavod im. G.I.Petrovskogo	Nizh. Novgorod	Marit. instr.	Tele-ctrl systems; Underwater sonar markers; Magnetic signature measurement	R&D; Design & constr.; Manufacture
NPP Aviatsionnaia i Morskaia Elektronika	St. Petersburg	Marit. instr.	Radio-electronic systems	R&D; Manufacture
Gorizont	Rostov-na-Donu	Marit. instr.	Radio navigation systems; Radio-electronic systems; Antennas; Digit. chart displays & info. systems	Manufacture
Shturmanskie pribory	St. Petersburg	Marit. instr.	Navigation devices	Instr. making
RATEP	Serpukhov	Marit. instr.	Ctrl systems for sea-based anti-aircraft missile & artillery systems	Design & constr.; Manufacture
KETZ	Kazan	Marit. instr.	Radio-electronic ID systems	Design & constr.; Manufacture; Maint. & repair
Zavod Fiolent	Simferopol	Marit. instr.	Automated ctrl systs	Design & constr.; Instr. making

However, there are some deviations from this general pattern that attract attention. For instance, RATEP is one of the original companies that become part of the

[239] Falichev 2021.

[240] Author's compilation of data from various Russian databases.

Almaz-Antey Corporation when it was founded in 2002.[241] This corporation is a state-owned vertically integrated defence concern that unifies, in particular, developers of anti-aircraft defence systems. Other *Almaz-Antey* entities are discussed below in the section on the marine ship-engineering segment.

Another interesting deviation is that the apparent largest owner of the *Kazanskii elektrotekhnicheskii zavod*, KETZ, is the Ministry of Land and Property Relations of the Republic of Tatarstan. According to 2018 data, it then controlled 42.6 per cent of the shares of KETZ.[242] This is of no surprise, as within the boundaries of Tatarstan, the ministry has business interests in a plethora of companies in all kinds of industrial branches.

In addition, in Russian-occupied Crimea, ownership over the *Fiolent* factory is shared by the Ministry of Land and Property Relations of the Republic of Crimea and the *Butomy* shipyard—each with a blocking minority of slightly more than 25 per cent of the shares—and the LLC *Benefit-F*, which controls about 33.4 per cent.[243] The *Butomy* shipyard is an interesting entity, as it appears to be one of the instruments used to take over the Ukrainian shipbuilding industry on Crimea, including the previously mentioned *Zaliv* shipyard in Kerch. Given the fixed assets that the *Butomy* shipyard thus controls, combined with its initial share capital of 4.5 billion roubles, it is unexpected to find that *Butomy* itself is controlled by two LLCs, *Vesta* (60 per cent) and *Enkor* (40 per cent).[244] Both entities were obviously registered in autumn 2015, in Cheboksary and in Samara, by two different physical persons; each company has an initial capital of only 10,000 roubles. In both cases, a limited partnership business associated with the shipbuilding corporation AK *Bars* controls 32 per cent of the capital. Furthermore, both entities have stated 'retail trade in foodstuffs including beverages and tobacco products' as their main business activity, and both entities have located their offices in apartment buildings.[245] It is therefore likely that *Vesta* and *Enkor* are nothing less than front organisations for *AK Bars*—the likely true owner of the *Butomy* shipyard—and, behind it, the *Zelenodolskii zavod imeni A.M. Gorkogo*.

5.3 The marine ship engineering segment

The Russian definition of marine ship engineering apparently comprises the application of engineering sciences to the development, design, operation and maintenance of watercraft propulsion systems, machinery, piping and oceanographic

[241] *RATEP* 20??.

[242] Kazanskii elektrotekhnicheskii zavod 2018.

[243] Zavod Fiolent 2020.

[244] Sudostroitelnyi zavod imeny B. E. Butomy 2019.

[245] Federalnaia nalogovaia sluzhba 2021e; Federalnaia nalogovaia sluzhba 2021f.

technology. In other words, it applies primarily to all kinds of mechanical systems and components in a maritime or inland-water environment.

Defined as such, the naval-related part of this segment is made up of 24 entities in Russia. The main corporations are JSC *Tactical Missiles Corporation*,[246] and one of its subsidiaries, the JSC *Concern Sea Underwater Weapon–Gidropribor*.[247] These two entities control, in concert, seven subsidiaries within the marine ship-engineering segment. Other major corporations are USC, SSTC, and FESRC, which control four entities together. As these corporations have been discussed in detail above in the shipbuilding and ship repair segment, they are only briefly deliberated on here. Finally, the remaining eleven companies are individual engineering companies whose affiliations seem to be more accidental than thoroughly deliberated as part of a major strategy.

Tactical Missiles Corporation

The *Tactical Missiles Corporation* is a leading Russian defence corporation under the control of the Federal Agency for State Property Management, *Rosimushchestvo*. As a rule, it is among the one hundred largest defence companies in the world. Its primary business activities are design, production and modernisation of strategic and tactical air-launched weapons, unified seaborne weapon systems and radio-electronic equipment.[248] As such, it belongs to the aviation industry according to Russia's own classification of its defence industries.

The corporation is an early example of a post-Soviet defence corporation—a vertically integrated structure, bringing together several companies with analogous or complementary production. It was established in March 2003, based on Presidential Decree number 84, which had been issued in January the previous year. Five subsequent presidential decrees, issued between May 2004 and February 2018, went on later to provide for a further expansion to 38 companies.[249] Four of these are related to the naval shipbuilding industry, which is the reason why the corporation is included in this report. One of these entities is the *Concern Granit-Electron*, which is discussed in detail in the section related to the marine instrumentation segment. The remaining three companies belong to the marine ship-engineering segment. All four companies are presented in Table 5.12.

Concern Granit-Electron and *Design Bureau Mashinostroeniia* are entirely under the control of *Tactical Missiles Corporation*. As for *Concern Sea Underwater Weapon–Gidropribor*, it is known that in 2016, *Tactical Missiles* controlled 76.5

[246] In Russian: *Korporatsiia Takticheskoe raketnoe vooruzhenie*, KTRB.

[247] In Russian: *AO Kontsern Morskoe podvodnoe oruzhie – Gidropribor*.

[248] *Tactical Missiles Corporation* 2018a.

[249] *Korporatsiia Takticheskoe Raketnoe Vooruzhenie* 2018.

per cent of the shares and the Federal Agency for State Property Management, *Rosimushchestvo*,—the residual 23.5 per cent.[250]

The ownership picture is significantly more complicated in the factory *Krasnyi gidropress*. Judging by its lists of affiliated persons, it appears that ownership was first transferred from *Rosimushchestvo* to *Tactical Missiles*—less one share.[251] However, by mid-2018, *Tactical Missiles* itself owned only 49.0192 per cent of the *Krasnyi gidropress*. The remaining part—50.98074 per cent—had been distributed among eleven of its daughter companies, of which one is the above-mentioned Design Bureau *Mashinostroeniia*. The other ten companies are not explicitly associated with the naval shipbuilding sector. The largest owners besides *Tactical Missiles* in 2018 were the Vympel State Engineering Design Bureau and Globus Design Bureau. Together, they might obtain a blocking minority amounting to just over 27 per cent of the total common share capital in *Krasnyi gidropress*.[252] It is not known to the author of this study why this internal redistribution of the ownership of *Krasnyi gidropress* has taken place within the *Tactical Missiles Corporation*.

Table 5.12: Affiliated naval-related companies of Tactical Missiles Corporation[253]

Name	City	Subsector	Field of interest	Type of work
Concern Granit-Electron	St. Petersburg	Maritime instr.	Complex radio-electronic & information ctrl systems	R&D; Design & constr.; Manufacture
Concern Sea Underwater Weapon–Gidropribor	St. Petersburg	Ship engr.	Torpedoes & mines; Hydroacoustic CMs; Autonom. unmanned underwater vehicles	R&D; Design & constr.; Manufacture
KB Mashinostroeniia	Moscow	Ship engr.	Torpedoes & mines; Launch. systs; Coastal missile systems; EW-systems	R&D; Design & constr.;
Krasnyi gidropress	Taganrog	Ship engr.	Anti-ship missile launchers; Torpedo tubes; Minesweeping armament; Amphibious air cushion blowers; Propellers; Ship filters; Desalination distillation plants	Design & constr.; Manufacture

Remarks: Ship engr., Ship engineering. CMs, countermeasures. ASCM, anti-ship cruise missile. C2, command and control. EW, electronic warfare.

The head office of the entire corporation is located in the city of Korolev, Moscow region. About a fourth of all its subsidiaries are located either in the city of Moscow or to its surrounding region.[254] This pattern recurs for the naval entities of the

[250] Kontsern Morskoe podvodnoe oruzhie – Gidropribor 2016.

[251] Krasnyi gidropress 2012.

[252] Krasnyi gidropress 2018.

[253] Author's compilation of data from various Russian databases.

[254] *Tactical Missiles Corporation* 2018b.

corporation as well; the construction bureau *Mashinostroeniia* is located in Moscow, the two concerns *Granit-Electron* and Sea Underwater Weapon–*Gidropribor* have their main offices and much of their activities in Saint Petersburg, and *Krasnyi Gidropress* has its office in Taganrog, Rostov, in the Southern District.

The amalgamation of manufacturers of land, air and seaborne weaponry into the *Tactical Missiles Corporation* is generally considered as successful, and it has served as a model for later consolidations within other defence segments and sectors. In addition to the state defence orders, the corporation also has extensive export to at least twelve countries, which brings in coveted hard currency. In its entirety, the corporation appears to rest on a reasonably stable economic ground. Notwithstanding the hardship of recent years, caused by sanctions and, since 2020, Covid-19, general director Boris Obnosov claims that the concern is doing well. In particular, the two naval concerns within the corporation, *Granit-Electron* and before that, Sea Underwater Weapon–*Gidropribor*, have nevertheless required the attention of the corporate management to solve their financial and economic problems.[255]

The Concern Sea Underwater Weapon–Gidropribor

The other major enterprise within the marine ship-engineering segment, besides *Tactical Missiles*, is the *Concern Sea Underwater Weapon–Gidropribor*.[256] As already noted, *Gidropribor* is also one of three concerns within the *Tactical Missiles Corporation*; the other two are *Granit-Electron*, in the marine instrumentation segment, and NPO *Mashinostroeniia* –a leading company in rocket science and space technology. *Gidropribor*, in turn, controls five subsidiaries. Two are active in ship engineering and the other two are working with electrochemistry and batteries. All companies are listed in Table 5.13. *Elektrotiaga* is usually referred to as one company, although it is in fact two different legal persons.

The JSC *Concern Sea Underwater Weapon–Gidropribor* is the legal successor to the ceased FSUE Central Research Institute *Gidropribor*, as it was reorganised as a JSC in December 2006, in accordance with Presidential Decree number 133, dated 3 February 2004.[257] As mentioned above, since late December 2016, *Tactical Missiles Corporation* controls slightly more than three-fourths of the concern and the Federal Agency for State Property Management, *Rosimushchestvo*, slightly less than a fourth.[258]

[255] Falichev, Oleg 2021.

[256] In Russian: *Kontsern Morskoe podvodnoe oruzhie – Gidropribor*, MPO Gidropribor.

[257] *Kontsern Morskoe podvodnoe oruzhie – Gidropribor* 2020; Federalnaia nalogovaia sluzhba 2021g.

[258] Kontsern Morskoe podvodnoe oruzhie – Gidropribor 2016.

Table 5.13: Affiliated companies of Concern Sea Underwater Weapon–Gidropribor[259]

Name	City	Subsector	Field of interest	Type of work
Uralelement	Verkhnii Ufalei	Electr. engr.	Electrochemistry & batteries	Manufacture
AO ELEKTROTIaGA	St. Petersburg	Electr. engr.	Electrochemistry & batteries	R&D; Design & constr.; Manufacture
ZAO ELEKTROTIaGA	St. Petersburg	Electr. engr.	Electrochemistry & batteries	R&D; Design & constr.; Manufacture
Zavod Dagdizel	Kaspiisk	Ship engr.	Diesel engines; Torpedoes & mines	R&D; Design & constr.; Manufacture
NII Morteplotekh-niki	Lomonosov	Ship engr.	Torpedoes & mines	R&D

If both *Elektrotiaga* companies are dealt with as two different entities, four of the five subsidiaries were added to *Gidropribor* in 2008. The last addition was *Uralelement*, which was added to the concern in 2012. However, it was only in January 2019 that *Gidropribor* gained full control over *Uralelement*. Before, it had shared ownership with one or several undisclosed minority shareholders who were unable to form a blocking minority.[260] As of early 2021, *Gidropribor* controlled exactly 72.852 per cent of the shares in *Dagdizel*. It is not known who controls the remaining part, which thus might constitute a blocking minority.[261] The last known public register data about *NII Morteplotekhniki* and the public JSC *Elektrotiaga* are of an earlier date, which means that possible later changes are not reflected in the information. Anyhow, in late 2014, *Gidropribor* shared ownership in *NII Morteplotekhniki* with the Federal Agency for State Property Management, *Rosimushchestvo*—63.1 per cent versus 36.9 per cent.[262] In 2015, its share in *Elektrotiaga* amounted to 92.6955 per cent.[263]

The geographic centre of gravity of the concern is in Saint Petersburg, where the main office, as well as both *Elektrotiaga*, are located. *NII Morteplotekhniki* is close by, in Lomonosov, in the Leningrad region. In contrast, *Uralelement* is located in Verkhnyi Ufalei, Cheliabinsk region, and *Zavod Dagdizel*, in Kaspiisk. The latter is not only a city-forming but also a region-forming enterprise[264] for Dagestan.[265]

[259] Author's compilation of data from various Russian databases.

[260] Verkhneufaleiskii zavod Uralelement 2021.

[261] Zavod Dagdizel 2021.

[262] NII Morskoi teplotekhniki 2016.

[263] Elektrotiaga 2015.

[264] In Russian: *Grado- i regionoobrazuiushchee predpriiatie*.

[265] Falichev 2021.

Gidropribor is Russia's leading concern for development, design and construction and production of naval underwater arms. Its production is focused on torpedoes, sea mines, mine countermeasures, acoustic countermeasures, and, to some extent, on unmanned underwater vehicles. As an integrated structure, *Gidropribor* masters the entire production chain. Allegedly, 95 per cent of all types of naval underwater weapons currently in use by the Russian Navy were developed by the concern or with its direct participation. Its products are used in 24 countries worldwide.[266]

Despite its strategic importance, *Gidropribor* and its subsidiaries have had their share of economic hardship. It is probable that its inclusion in the larger *Tactical Missiles Corporation* might partially have been an effort to come to terms with the situation.[267] Taking into account the order portfolio for the next few years, *Gidropribor* general director Vladimir Patrushev nevertheless assessed the situation in early autumn 2020 as stable.[268] In recent years, there has also been a lot of development regarding new and modernised torpedoes, which appears to have strengthened the market position of the concern.

In 2018, there was information that *Gidropribor* would participate in the reconstruction of the Bukhta Dvuiakornaia in Crimea. In Soviet times, this entity was a production facility for *Gidropribor* torpedoes, including those with nuclear charges. Under Ukrainian jurisdiction, its facilities had allegedly been mothballed for the preceding decade, at the time when Russia took over Crimea by force, in 2014. The factory was then nationalised by the new Crimean authorities and organised as a state unitary company of the Republic of Crimea in summer 2015, with the aim of restoring the enterprise. In 2018, there were some proposals to transfer the factory to federal ownership. It was telling that in the same year it became known that the Russian Navy planned to resume testing the latest torpedoes at a training ground in its vicinity, near Feodosiia.[269] As of early 2021, it has not been possible to find any information confirming that these plans are being implemented. At that time, Bukhta Dvuiakornaia was still under republican and not federal ownership.[270]

[266] Kontsern Morskoe podvodnoe oruzhie – Gidropribor 2021.

[267] Falichev 2021.

[268] Novichkov and Fediushko 2020b.

[269] *Voennno-promyshlennyi kurer* 2018.

[270] Federalnaia nalogovaia sluzhba 2021h.

Other companies within the marine ship engineering segment

Besides the *Tactical Missiles Corporation*, and the *Concern Granit-Electron* and their affiliated companies, there are another fourteen companies within the marine ship-engineering segment. They are listed in Table 5.14.

Table 5.14: Other companies within the marine ship-engineering segment[271]

Name	City	Subsector	Field of interest	Type of work
Khabarovskii zavod imeni A.M. Gorkogo	Khabarovsk	Ship engr.	Ship winches & cranes; Water jet ejectors; Heat exchangers	Manufacture
Proletarskii zavod	St. Petersburg	Ship engr.	Marine & power engr.	Design & constr.; Manufacture; Maint. & repair
Centr. Res. Inst. of Marine Engineering	St. Petersburg	Ship engr.	Ship machines & mechanisms	R&D
SRZ-179	Khabarovsk	Ship engr.	Diesel engines	Maint. & repair
Zavod Burevestnik	Gatchina	Ship engr.	Ship fittings; Heat exchangers; Underwater propulsion	Manufacture
Askold	Arsenev	Ship engr.	Ship fittings	Manufacture
Spets. Konstruktorskoe Biuro Kotlostroeniia, SKBK	St. Petersburg	Ship engr.	Boilers	Design & constr.; Manufacture
Public JSC ZVEZDA	St. Petersburg	Ship engr.	Diesel engines, gears, reduction drives	Manufacture
Kaluzhskii turbinnyi zavod	Kaluga	Ship engr.	Turbines	R&D; Design & constr.; Manufacture
Zavod im. Gadzhieva	Makhachkala	Ship engr.	Marine pumps; Ship fittings; electro-hydraulic steering machines	Manufacture
Kompressor	St. Petersburg	Ship engr.	Compressors	Manufacture; Maint. & repair
Zavod Variag	Vladivostok	Ship engr.	Electrohydr. steering & control syst.	Manufacture
Vineta	Nikolskoe	Ship engr.	Mechanical processing of metal products	Manufacture
Morskaia inzhiniringovaia kompaniia AKVA-SERVIS	St. Petersburg	Ship engr.	Educational & training complexes	Design & constr.; Manufacture

Khabarovskii zavod imeni A.M. Gorkogo, KhSZ, and *Proletarskii zavod* are ship engineering companies within USC. *Proletarskii zavod* has a subsidiary of its own, the *Central Research Institute of Marine Engineering*.[272] It is also included in Table 5.14. *Proletarskii zavod* controls at least 20 per cent of the shares; possibly more.[273] In any case, this research institute had already emanated from the former

[271] Author's compilation of data from various Russian databases.

[272] In Russian: *Tsentralnyi nauchno-issledovatelskii institut sudovogo mashinostroeniia*, TsNII SM.

[273] Proletarskii zavod 2021.

construction bureau of the *Proletarskii zavod* in the 1970s, and today they appear as complementary twin organisations for the entire production chain within their niche.[274]

The *Rosneft* sphere is also represented in Table 5.14. In this case, by FESRC, which controls the SRZ-179, a ship repair yard that today is the only yard in eastern Russia for repair and maintenance of ship diesel engines.

As previously mentioned, the *Zavod Burevestnik* is the only subsidiary of the *Shipbuilding and Ship Repair Technology Centre*, SSTC, one of two major research institutes within the shipbuilding and ship repair segment under direct control of the Federal Agency for State Property Management, *Rosimushchestvo*. *Zavod Burevestnik* is one of three major Russian manufacturers of ship fittings. The others are *Askold*, which is also listed in Table 5.14, and *Armalit*, which is not. *Armalit*, however, is the majority owner of another company in the table, namely the *Spetsialnoe Konstruktorskoe Biuro Kotlostroeniia*, SKBK, a manufacturer of boilers.

The public JSC *Zvezda* is a manufacturer of ship diesel engines, gears, and reduction drives. With outdated products on offer, for which there was no real demand, it led a languishing existence until 2014, as Russian consumers, including the Navy, instead bought their ship diesel engines from Germany, Finland, and Ukraine. In 2014, when foreign suppliers stopped supplying engines and powertrains to the Russian Navy, due to the sanctions regime, *Zvezda* all of a sudden turned into a strategic company. *Zvezda* could nonetheless cope with increasing demand for its products and pressure to modernise on its own. It was therefore bought up by the Yekaterinburg machine-building holding company Sinara, in June 2018.[275] The most important event for *Zvezda* in 2020 was the completion of qualified tests of redactors for the first Russian-made power train for the frigate Project 22350. They were also tested together with the diesel-gas turbine unit that is designed and manufactured by NPO Saturn, for Project 22350.[276]

The turbine factory *Kaluzhskii turbinnyi zavod* is connected to the LLC *Severgrupp,* a private investment company, through the LLC *NordEnergoGrupp*, which is the sole holder of all its common shares.[277] *Severgrupp*, in turn, is related to the *Severstal* sphere, a major Russian steel and steel-related mining company.[278]

The remaining five companies have private owners. A somewhat odd bird compared to other companies in the segment is the Marine Engineering Company

[274] Gnennoi 2020.

[275] Fomicheva 2018.

[276] Grebneva 2020.

[277] Kaluzhskii turbinnyi zavod 2021; *Severgrupp* 2019.

[278] Publichnoe aktsionernoe obshchestvo Severstal 2021.

Aqua-Servis[279]. *Aqua-Servis* is one of the leading Russian constructors and manufacturers of training complexes for the military and civilian fleet. It is also in the business of installation and adjustment, repair and service and maintenance of ship automation and electrical equipment.[280]

5.4 The electrical ship engineering and wiring segment

The subindustry of electrical ship engineering and wiring consists of firms that install electrical equipment and cables on ships and maritime facilities. It also encompasses developers and manufacturers of electrical equipment and electrochemical devices. In accordance with this definition, twelve companies in total were included in the 2015 List of Organisations included in the Consolidated Register of the Defence Industrial Complex. They are shown in Table 5.15.

Table 5.15: Companies within the ship electrical engineering and wiring segment[281]

Name	City	Subsector	Field of interest	Type of work
Uralelement	Verkhnii Ufalei	Electr. engr.	Electrochemistry & batteries	Manufacture
AO ELEKTROTIaGA	St. Petersburg	Electr. engr.	Electrochemistry & batteries	R&D; Design & constr.; Manufacture
ZAO ELEKTROTIaGA	St. Petersburg	Electr. engr.	Electrochemistry & batteries	R&D; Design & constr.; Manufacture
SDEBE	Moscow	Electr. engr.	Electrochemical air regeneration	Design & constr.
NPA Arktika	Severodvinsk	Electr. engr.	Electr. install. & adjustm.	Installation work
VC ERA	Vladivostok	Electr. engr.	Electr. install. & adjustm.	Manufacture; Installation work
Kaliningradskoe predpriiatie ERA	Kaliningrad	Electr. engr.	Electr. install. & adjustm.	Manufacture; Installation work
ZAO Bolshekamenskaia Era	Bolshoi Kamen	Electr. engr.	Electr. install. & adjustm.	Manufacture; Installation work
ElektroRadioAvtomatika	St. Petersburg	Electr. engr.	Electr. install. & adjustm.	Manufacture; Installation work
Zavod Krizo	Gatchina	Electr. engr.	Demagnetising devices; Automatic fire detection systems	Design & constr.; Manufacture
Uralelectro	Mednogorsk	Electr. engr.	Electric motors	Design & constr.; Manufacture
Cheboksary Electric Apparatus Plant	Cheboksary	Electr. engr.	Electrical equipment	Design & constr.; Manufacture

[279] In Russian: Morskaia inzhiniringovaia kompaniia AKVA-SERVIS.

[280] *Morskaia inzhiniringovaia kompaniia AKVA-SERVIS* 2020; Konfisakhor and Kovtun 2012.

[281] Author's compilation of data from various Russian databases.

Three of the companies in the table, *Uralelement* and both of the *Elektrotiaga* are subordinate to *Concern Sea Underwater Weapon–Gidropribor*, and therefore also appear in Table 5.13. They develop and manufacture batteries that are used in final products from the concern.

Two companies belong in the USC sphere and are therefore also included in Table 5.1. The *Special Design Engineering Bureau in Electrochemistry with Experimental Factory*,[282] the SDEBE, is the USC centre for electrochemical devices, such as electrochemical air generation systems, afterburner furnaces, hydrogen and oxygen generators, thermosorption hydrogen compressors and hydrogen accumulators.[283] The *Northern Production Association Arktika*,[284] or NPA *Arktika*, carries out wiring work on military and civilian vessels and drilling rigs. It also works with service maintenance and repairs of maritime electric systems and design and manufacture of certain electrical products.[285]

The *Rosneft* sphere is represented in the electrical ship engineering and wiring segment with one company controlled by *Modern Shipbuilding Technologies*, the *Vladivostok Company Electroradioautomatica*,[286] VC ERA. It is also listed in Table 5.3. Its main activities are providing services for installation, repair and maintenance, and rewinding of electric motors, generators and transformers. It also manufactures certain electrical components.[287]

In the table are three other companies with similar names and similar activities: KC *Era*, in Kaliningrad; *Bolshekamenskaia* ERA, in Bolshoi Kamen; and *Elektroradioavtomatika*, in Saint Petersburg. None of them has the same owner. Ownership of *Elektroradioavtomatika* is shared between several private persons. As it is a very small company, BK ERA's owners are also most likely private persons. The main owner of *Elektroradioavtomatika* in Saint Petersburg is allegedly an LLC, *Optima Konsalt*, which has left few traces in Russian public registers.[288]

Zavod Krizo is an instrument-making electrical engineering firm in Gatchina, Leningrad region. It is specialised in high-tech products for radio-electronic ship equipment, such as fire protection and alarm systems, radio-communication control systems, electromagnetic field compensation systems, and ship power suppliers.[289] The general director is also the main shareholder, controlling slightly more

[282] In Russian: *Spetsialnoe konstruktorskoe biuro po elektrokhimicheskii s opytnym zavodom*, SKTBE.

[283] OSK 2021.

[284] In Russian: *Severnoe proizvodstvennoe obedinenie Arktika*, SPO Arktika.

[285] USC 2021f.

[286] In Russian: *Vladivostokskoe predpriiatie Elektroradioavtomatika*, VP ERA.

[287] VP ERA 2020?.

[288] ElektroRadioAvtomatika 2021.

[289] Flotprom 2021; Zavod Krizo 2021a.

than 64 per cent of the shares.[290] There are no reports on the remaining shareholders, although some statements have recurringly appeared in both its annual reports and reports on the voting results from its general meetings of shareholders that suggest that the state has kept at least one golden share in the company. This does not exclude the fact that the state also owns common shares in the company. The Department of Shipbuilding Industry and Marine Facilities of the Ministry of Industry and Trade keeps one seat on the board of directors.[291]

The *Mednogorsk Electrotechnical Plant Uralelectro*[292] is a producer of electric motors, including explosion-proof motors, motors specially adapted for maritime use and others for use in nuclear power plants.[293] The main shareholder is the *Concern Radiotechnical and Information Systems*,[294] or *Concern RTI Systems*, which controls 97.14 per cent of the common shares.[295] The *Concern RTI Systems* defines itself as one of the world leaders in the field of over-the-horizon radars and a leading Russian developer of powerful very long-range radars.[296] It is listed in the defence company list from 2015 as a military radio industry company. The concern belongs to the *RTI Group*, which is listed as the 86th largest defence com-pany in the 2017 List of Top 100 Defence Companies of *Defense News*.[297] The *RTI Group*, in turn, belongs to the *Sistema Financial Corporation*, a large investment conglomerate. The majority stake in Sistema belongs to the company chairman, Vladimir Evtushenkov, who is one of the richest men in Russia.[298]

The *Cheboksary Electric Apparatus Plant*,[299] JSC CHEAZ, also known as the CHEAZ group, is one of the leading enterprises in electrical engineering. According to its company information, it is fit for solving complex tasks of construction and upgrading of power distribution systems, from design to commission. Its products and solutions are used within several business areas, such as power generation and distribution, oil production and refining, nuclear power industry, railways and shipbuilding.[300] Its location in Cheboksary is no coincidence, as Chuvashiia is

[290] Zavod Krizo 2021b.

[291] Zavod Krizo 2020a; Zavod Krizo 2020b:2.

[292] In Russian: *AO Mednogorskii elektrotekhnicheskii zavod Uralelektro*, MEZ Uralelektro.

[293] Mednogorskii elektrotekhnicheskii zavod Uralelektro 2017.

[294] In Russian: *OAO Kontsern Radiotekhnicheskie i Informatsionnye sustemy*, Kontsern RTI Sustemy.

[295] Mednogorskii elektrotekhnicheskii zavod Uralelektro 2021.

[296] Kontsern Radiotekhnicheskie i informatsionnye sistemy 2021.

[297] TASS 2017.

[298] Sistema Financial Corporation 2020.

[299] In Russian: *OAO Cheboksarskii elektroapparatnyi zavod*, OAO ChEAZ.

[300] *CHEAZ* 2020.

one of Russia's centres for electrical engineering research and manufacturing, uniting over 40 electro-technical enterprises in the republic.[301] It has not been possible to find any registry information about the ownership structure of the company.

Overall, the electrical ship engineering and wiring segment is relatively heterogeneous, and plays a subordinate role as a subcontractor of components and services to other parts of the shipbuilding industry. Particularly *Gidropribor*, but also USC and *Modern Shipbuilding Technologies* control some companies, but it is evident that in these cases the companies are parts of much larger and more complex production chains.

[301] *Ministry of Economic Development, Department for Regulatory Policy and Regulatory Impact Assessment* 2020?.

6 Conclusions

The 1970s and -80s are often considered to be the golden years of the Soviet shipbuilding industry, and they have exerted a highly formative influence on present-day Russian shipbuilding in terms of its localisation, production capacity and technology. Current and future market prospects for Russia's shipbuilding industry, and the efficiency and robustness of the shipbuilding industrial structure built up under a decade and a half of structural reforms, are two decisive factors that may either mitigate or aggregate the industry's prospects for the future. The following sections discuss some of this study's takeaways regarding the market prospects for the naval subset of Russia's shipbuilding industry and the significance of its industry structure.

6.1 Market prospects

For historical reasons, Russia's shipbuilding industry demonstrates a considerable slant towards naval ship and vessel projects, including submarines. Although the entire shipbuilding industry, being less prioritised, lost competitiveness as the Soviet Union failed to adopt the new shipbuilding technologies that emerged under the 1970s and -80s, its civilian part has become even less competitive and more technologically backwards than its naval cousin has. The ability of most of its potential customers to pay is also weak, in spite of a theoretically huge demand. As for the few financially stronger ship owners, when given a choice, they have so far preferred to order their new ships from abroad or to equip their existing vessels with foreign maritime instrumentation and components due to the lack of competitiveness of the domestic civilian shipbuilding industry. Russia's current strategy for its civilian shipbuilding industry is to compete on the upper-end markets, thus following in the footsteps of most of the few remaining European shipyards. A promising niche market where Russia has a competitive edge is icebreaker construction. Small civilian mini-submarines might be another.

Export opportunities for the naval subset of the shipbuilding industry are constrained by limited global demand, which is further inhibited by different security considerations and geopolitical affiliations among potential buyers. Although there are global markets for smaller patrol ships, corvettes and diesel-electric submarines, where Russia is able to compete, for instance, its naval shipbuilding will always depend on Russia's own military procurements and state spending on naval ships, vessels and submarines. Without doubt, Russia's naval procurement will continue well into the 2030s. On the other hand, there are clear signals that the volume will shrink. This might put the naval subset of the industry under severe pressure, as its export options are limited, as is domestic demand for civilian ships, vessels and maritime structures.

The constrained market prospects for Russian shipbuilding indicate that both its civilian and naval segments will remain dependent on state orders, state support and preferential market rules. Although necessary to keep both sectors afloat, this might have a long-term negative impact on firm and industry performance and, in the end, Russian competiveness, within this sector.

6.2 Industrial structure

Based on the SCP model, the industrial structure of the Russian shipbuilding industry can be explained as a mixture of the conditions prevailing for the entire global industry and the Russian historical context. Its supply side is an oligopoly, sometimes even a monopoly, for specific market segments. The state acts as a monopsony buyer of the major share of the industrial output. Naval shipbuilding in particular takes place in a semi-market, semi-planned economy.

What possibly distinguishes Russian shipbuilding from similar industries in other countries is that it probably demonstrates the even more pronounced traits of a planned economy. There is hardly any organic development at all, as the state has used its administrative and economic power at its own discretion to set up state-controlled or -owned corporate groups, which dominate the entire industrial sector.

The modern, internal industrial structure of the naval subset of the Russian shipbuilding sector began to take form in the mid-2000s. The current major conglomerates in shipbuilding, marine instrumentation and marine engineering became the outcome of a process aiming to incorporate and fuse together mostly state-owned unitary entities that usually had their roots far back in the Soviet period or, in some cases, even in pre-revolutionary imperial times. The latest changes within marine instrumentation took place in December 2020, when four of the five major entities within this segment were fused into the new Marine Instrument Engineering Corporation. Although future changes cannot be ruled out, the major parts of the naval shipbuilding industry now seem to be in place.

The main takeaway from this entire process is that far from being random and haphazard, it has been ruled by underlying intentional strategic objectives, and affirmed in strategic plans, presidential decrees and governmental decisions. Successive structural changes are therefore probably not as much proof of failures as of adaptations to new circumstances or, possibly, the next step in a thought-out long-term plan to be taken when certain key figures have been met.

Still, the present system is not uniform, but demonstrates some inconsistencies. For instance, there is no direct relationship between organisational form and ownership structure. Usually, the state has taken control over the first tier of all system-critical companies and corporations by becoming the major or only shareholder in these entities. In some cases, though, the shareholder control of the state is indirect. The state is then the major shareholder in several companies that together might

achieve a shareholder majority in yet another company, in which the state owns no shares of its own.

Within the naval subset, the shipbuilding and ship repair segment as well as the marine instrumentation and the marine engineering segments are dominated by less than ten large conglomerates or industrial concerns. Although some of them are cross-sectional, with subsidiary companies in several segments, they are always specialised in a single segment. The cross-sectional trait is therefore auxiliary to the core business, at most, or just a historical remnant. The main organisational principle is horizontal integration of companies within the same segment with similar production. Within these structures, there might also be one or several specialised R&D institutes or construction bureaus. The fourth segment relates to electrical engineering and wiring. Although some conglomerates from the other segments are represented, most remaining owners appear to lack other affiliations to Russia's shipbuilding industry and have private owners. They are thus true subcontractors, acting in a more competitive market. The entire segment is thus auxiliary to the other segments, and the state has so far left its structure more or less unregulated.

The state exercises its control, among other things, through its right to appoint representatives to the actual board of directors of each entity of which it is in possession. It is a common practice to appoint high-level civil servants from related ministries and agencies. In particular, the Ministry of Industry and Trade is well represented on several boards.

Other common appointments are industrialists and company managers from other state-controlled companies within the naval shipbuilding industry, or, for instance, from the oil and gas industry. Some of these individuals appear to have been deliberately cultivated for several years in order to reach the positions they hold today. They have alternated between pertinent senior administrative positions within the federal state bureaucracy and several company management teams and have thus been given the opportunity to acquire particularly important insights and experience, as well as a broad perspective on the entire industry. This background appears to be particularly useful for coordinating the activities of related companies within the industry with the comprehensive development objectives of the state.

6.3 Prospects for 2030 and beyond

In sum, in the absence of any external shocks, the current market conditions and the industrial structure appear to be sufficiently stable in order to preserve their major traits well into the 2030s and beyond: market prospects for the entire Russian shipbuilding industry, including its naval sector, are bleak, and Russia's options for enhancing them are limited. At the same time, the industrial structural system has transformed the shipbuilding industry into a sufficiently effective

branch for Russia's needs. The structure is based on simultaneous multilevel systemic thinking, and it may compensate for some of the bleak market prospects. For these reasons, in Russia there are no real incentives to make any fundamental changes to the current system.

A stable industrial structure is a guarantee that its title as Russia's shipbuilding capital will be retained by the city of Saint Petersburg and that Severodvinsk and Kaliningrad remain its most important satellites for the foreseeable future. Still, the upgrading of Russia's shipbuilding capacity in the Far East, as well as the transposition of the *de jure* Ukrainian shipyards in Crimea into its naval shipbuilding programme in the south somewhat changes the centre of gravity of Russian shipbuilding. This, in turn, may have a long-term impact on Russia's disposition of its naval forces, which might affect the countries adjacent to Russia's eastern and south regions.

Another factor to consider for other countries is the significance of the entrance of the *Rosneft* conglomerate into the Russian shipbuilding industry in Russia's Far East and in its north. Although *Rosneft* has a predominant interest in civilian shipbuilding and drilling platforms to meet its own requirements for transportation of hydrocarbons and to exploit the continental shelf, it has nevertheless become a corporate owner of entities associated with naval shipbuilding and repair. For instance, does this involvement create grounds for considering *Rosneft* to be a defence company? If so, would any new sanctions imposed on Russia's defence industry affect *Rosneft* in such a way that it would have an impact on the world oil markets?

A final aspect of the structural reforms Russia is carrying out within its shipbuilding industry is that they fit well together with Russia's quest for technological self-sufficiency. This policy only took off in earnest in the wake of the sanctions imposed on Russia from 2014 onwards—that is a much later date than the first structural reforms within the shipbuilding industry, which started in the late 2000s. The long-term geostrategic implications of this policy of technological solitude are that they allow for continued confrontation with Western countries. In terms of sea power, the still unanswered question for the 2030s is the extent to which this force measurement will take place on either the high seas and in far-away theatres, or occur closer to Russia's own shorelines, depending on the type of ships Russia will build during the next decades to replenish its naval fleets. A constraining factor that could mitigate Russia's naval shipbuilding plans is any remaining industrial dependence on Western machinery equipment or any input goods. However, this issue has not been addressed in this report, and must be left to further research.

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Under the political leadership of President Vladimir Putin, Russia has once again demonstrated a more determined commitment to its naval forces and, consequently, to its shipbuilding industry. Previous and current armament programmes and far-reaching structural reforms, from the late 2000s to the early 2020s, have been of great importance in Russia's attempts to bring order to the naval subset of the shipbuilding industrial branch.

This study explores the Russian shipbuilding market and the current industrial structure of the naval subset of the industry. These two are important determinants for not only how Russian shipbuilding will develop in the coming decades, but also Russia's ability to meet its geostrategic and foreign policy goals.

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