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ACTIVITY OF MYKOLAYIV SHIPBUILDING ENTERPRISES IN 1914 – 1916

Summary. The purpose of the research – to analyze activity of Mykolayiv shipbuilding enterprises «Rossud» and «Naval» in 1914 – 1916 with the definition of circumstances that influenced on the volumes of manufactured products and the commissioning of ships. **The research methodology** is an organic set of basic principles of historical research: historicism, objectivity, comprehensiveness, continuity and appropriate methods of scientific research. Various methods of cognition are used in the article: historiographical analysis and synthesis, historical, problem-chronological, statistical, comparative, behavioral, content analysis, critical discourse analysis. **The scientific novelty** is that for the first time the activity of Mykolayiv shipbuilding factories as separate business objects was analyzed, the leadership of which tried to preserve the branch of its power and, at the same time, highlighted the problems and challenges faced by industry in the conditions of the First World War. **Conclusions.** The volumes of financing of Mykolayiv shipbuilding enterprises testifies to the scale of investments in the development of the shipbuilding industry. However, problems in the area of financing created a rise in the cost of labor, increased payment for certain materials and their transportation by rail. At the same time, the rate of development of funds by shipyards at least until the end of 1916 remained fairly high. It turned out that the shipbuilding industry, which acted as an accelerator for related industries, was extremely vulnerable to the disruption of production links, as equipment for ships was manufactured in different regions of the Russian Empire. A positive role in the organization of the work of Mykolayiv's shipbuilding enterprises was played by the introduction of a chord system of remuneration and premiums for early qualitative execution of works, which allowed to provide a high level of motivation to work, first of all, by highly skilled workers. The concentration of production, and first and foremost, the interaction and specialization of Mykolayiv shipbuilding factories «Naval» and «Rossud», allowed to implement large-scale projects in the field of shipbuilding. These include serial production of battleships, dreadnoughts, cruisers, turbine destroyers and submarines.

Key words: The First World War, shipbuilding industry, «Naval», «Rossud», hired workers, state regulation of economy, military industry, finances, credit.

ДІЯЛЬНІСТЬ МИКОЛАЇВСЬКИХ СУДНОБУДІВНИХ ПІДПРИЄМСТВ У 1914 – 1916 рр.

Анотація. Мета дослідження – проаналізувати діяльність миколаївських суднобудівних підприємств «Россуд» і «Наваль» у 1914 – 1916 рр. з визначенням обставин, що впливали на обсяги виготовленої продукції і введення в експлуатацію кораблів. **Методологія дослідження** становить органічну сукупність базових принципів здійснення історичного дослідження: історизму, об'єктивності, всебічності, наступності й відповідних методів наукового пошуку. У статті застосовано різноманітні методи пізнання: історіографічного аналізу та синтезу, історичний, проблемно-хронологічний, статистичний, компаративний, біхевіористичний, контент-аналізу, критичного дискурс-аналізу. **Наукова новизна** полягає у тому, що вперше аналізується діяльність миколаївських суднобудівних заводів як окремих підприємницьких об'єктів, керівництво яких намагалося зберегти галузь її потужності, та водночас висвітлюються проблеми і виклики, з якими зіткнулася промисловість в умовах Першої світової війни. **Висновки.** Обсяги фінансування миколаївських суднобудівних підприємств свідчать про масштабність вкладання коштів у розвиток суднобудівної галузі. Однак проблеми у сфері фінансування спричинили подорожчання вартості робочої сили, збільшення оплати за окремі матеріали та їх перевезення залізничним транспортом. Водночас темпи освоєння коштів суднобудівними заводами принаймні до кінця 1916 р. залишалися досить високими. З'ясувалося, що суднобудівна промисловість, яка виступала акселератором для суміжних галузей виробництва, надзвичайно вразлива до порушення виробничих зв'язків, оскільки обладнання для суден виготовлялося у різних регіонах Російської імперії. Позитивну роль в організації роботи суднобудівних заводів Миколаєва відіграло запровадження акордної системи оплати праці та преміювання за дострокове якісне виконання робіт, що дозволило забезпечити високий рівень мотивації до виконання праці, насамперед, працівниками вищої кваліфікації. Концентрація виробництва, і у першу чергу взаємодія і спеціалізація миколаївських суднобудівних заводів «Наваль» і «Россуд», дозволили втілити у життя масштабні проекти у сфері суднобудування. До них можна віднести серійне виробництво лінкорів-дредноутів, крейсерів, турбінних міноносців та підводних човнів.

Ключові слова: Перша світова війна, суднобудівна промисловість, «Наваль», «Россуд», наймані працівники, державне регулювання економіки, військова промисловість, фінанси, кредит.

Problem statement. During the First World War, the shipyards of Mykolayiv «Rossud» and «Naval» continued to be renovated at an accelerated pace, launched even before the beginning of hostilities, including for the construction of ships of increased displacement like «Empress Maria». Much of the production capacity was involved in the accelerated production of mechanisms and parts of ships. In addition, during the war sharply increased the production of destroyers, transport ships and port tugs.

In modern conditions, when Ukraine is in a military conflict with the Russian Federation, it is important to study the previous experience in preserving the shipbuilding industry with its capacities, challenges and problems faced by the industry in a wartime situation.

The analysis of sources and recent researches. This problem in the all-russian context was studied in the works of O. Shershov (Shershov, 1940; Shershov, 1952), K. Shatsillo (Shatsillo, 1968), in a collective work edited by I. Spasskiy (Spasskiy, 1995), A. Taras (Taras, 2002), V. Babich (Babich, 2003). Partly the development of the shipbuilding industry during the war years was considered by N. Ryzheva (Ryzheva, 2008), L. Sinyavska (Sinyavska, 2014), V. Kulikov (Kulikov, 2014a), (Kulikov, 2014b).

The publication's purpose. To analyze the activity of Mykolayiv shipbuilding enterprises «Rossud» and «Naval» in 1914 – 1916 with the definition of circumstances that influenced on the volume of manufactured products and the commissioning of ships.

Statement of the basic material. During 1914 preparations were made for the intensive work of the Mykolayiv shipyards and accelerated pace continued to be carried out on refurbishment and their modernization. According to the controller of the plant «Rossud» K. Vaschalov, the finances of the company were used to launch a new crane for sorting steel at the main warehouse. According to the plan for the expansion of the plant, the necessary machines were purchased, protected by the coastal areas of the coast, barracks for firefighters were built at the depot, and the branch of the railway continued to the marine hospital. In addition, since the autumn of 1914, the main attention was paid to the construction of the battleship «Empress Maria», as the government demanded the acceleration of the delivery of this ship. The number of workers reached 3 thousand people and in the year they were paid wages in amount of 1 million 757 thousand 622 rubles. The costs of 1914 for the construction of the battleships «Empress Maria», «Emperor Alexander III», the floating dock, the cruisers «Admiral Nakhimov», «Admiral Lazarev», «Admiral Istomin», «Admiral Kornilov» amounted to 5 million 944 thousand 186 rubles (State Archive of Mykolayiv Region – SAMR, f. 300, d. 1, c. 124, p. 29–31).

The process of building new battleships has revealed some difficulties and features of financing such projects. The rate was made on the widespread attraction of bank capital and private entrepreneurship. According to the contract from March 31, 1912 with «Rossud», for each of the battleships «Empress Maria» and «Emperor Alexander III» the plant should have received 19 million 719 thousand 654 rubles. At the same time, the general estimate for the purchase of mechanisms abroad should not exceed 1 million rubles, with the agreement of the list of ordered equipment with the Council of Shipbuilding. Ordering of mechanisms abroad was carried out exclusively through the central establishments (SAMR, f. 300, d. 1, c. 526, p. 1). In the case when certain equipment should have been created by Russian enterprises, that did not belong to the «Rossud», it was manufactured exclusively under the control of representatives of the Marine Ministry Commission with appropriate reimbursement of the plant's costs (SAMR, f. 300, d. 1, c. 11, p. 24–31). For example, «Rossud» gave to the plant «G. A. Lessner» an order to manufacture submarine mines and other mechanisms of battleships «Empress Maria» and «Emperor Alexander III» for the amount of 278 500 rubles, provided that they would be erected on the ship by «Rossud» (SAMR, f. 300, d. 1, c. 14, p. 27–29).

The beginning of the First World War increased the government's attention to the work of the shipbuilding industry on the one hand, and, on the other hand, significantly complicated the supply of shipbuilding plants with the necessary materials and created some difficulties in providing skilled personnel. The «Naval's» leadership was forced to appeal to the Maritime Ministry with a request to provide supplies to the factory of steel products and armor for ships. The appeal indicated that for the needs of «Rossud» and «Naval» abroad about 8 thousand tons of steel were ordered, as well as almost the same amount of steel parts for the mechanisms of the ships. Due to the impossibility in the conditions of the war to ensure the delivery of these materials and products it was proposed to place appropriate orders on the territory of the Russian Empire with the condition of their speedy execution. The attention of the Maritime Ministry was drawn to the fact that the concern «Prodamet» and the Kolomensky factory, as the only suppliers of steel and iron in Russia, refused to guarantee the urgent supply of materials. In such circumstances, shipyards also could not provide a guarantee of the commissioning of warships in accordance with certain deadlines. The Maritime Ministry was requested to take appropriate measures to ensure that the metallurgical plants that were

part of the «Prodamet» undertook obligations under the orders of «Rossud» and «Naval», which concerned the manufacture of steel products for the shells of warplanes, tower installations and ammunition out of turn, even to stop the execution of other orders (SAMR, f. 297, d. 1, c. 150a, p. 98–99).

In the appeals of the management of the Mykolay shipyards to the Marine Ministry, it was noted that however «Naval» and «Rossud» were executing exclusively state orders, it was necessary to arrange their unimpeded urgent supply of necessary materials with a clear strict schedule of receipt of necessary products. It was suggested to abandon the practice of constant coordination with the Ministry of the order of determining the transport companies, which were to provide the transportation of necessary goods. The Maritime Ministry was requested to transfer all cargoes which were intended for Mykolayiv shipbuilding factories into an emergency category with the approval of the relevant instructions for commandants of all nodes of the European part of the Russian Empire. Such cargoes should have been classified as «A», which would exclude, according to the management of the factories, delays in delivery of the necessary cargoes (SAMR, f. 297, d. 1, c. 150a, p. 107–108).

However, the Marine Minister repeatedly appealed to the leadership of the «Society of Nikolaev factories and shipyards» with a request to accelerate the construction of the battleship «Empress Maria». Appealing to the patriotic feelings of the administration and the workers, the minister pointed to the need to accelerate the installation of weapons of the ship, for which offered to work around the clock (SAMR, f. 297, d. 1, c. 150a, p. 74). By the way, in addition to accelerating the construction of linear ships, it was also required to make every effort to bring the destroyers and submarines into operation as soon as possible (SAMR, f. 297, d. 1, c. 150a, p. 76).

For a successful completion of work Mykolayiv shipyards were forced to apply to the headquarters of the Supreme Commander-in-chief with a request to relieve the most qualified workers from the array of forces. In particular, the applications indicated the specialization, the qualifications of the workers and the approximate amount of work that could be performed provided they were brought to work (SAMR, f. 297, d. 1, c. 150a, p. 191). In addition, in order to meet the growing demand for labor, the leadership of Mykolay shipyards was forced to apply to the Maritime Ministry with a request to provide him at the disposal of 500–800 inmates who were in the Mykolay penal colony for the purpose of their involvement in conducting earthworks (SAMR, f. 297, d. 1, c. 150a, p. 130).

Despite the high rates of construction of the «Empress Maria», certain problems in the construction were caused by orders of the company «Rossud» in England turbines, some auxiliary mechanisms, crankshafts and deadwood devices. In time financed, these items were delivered only in May 1914. In the face of an increased threat of war, the implementation of this contract remained an exception to the rules. At the same time, to accelerate the introduction of the battleship «Empress Catherine II» (from June 14, 1915, «Empress Catherine the Great»), which was built by the «Society of Nikolay factories and shipyards», the Maritime Ministry had to take a number of urgent measures: the factory «Naval» handed over the armor of the towers, battle cabinets, separate casing and chimneys from the third battleship in the series «Emperor Alexander III», and also spare guns of 305-mm of Baltic battleships «Gangut» type – «Sevastopol» and «Poltava». From the battleship «Emperor Alexander III» for the completion of «Empress Maria» was also taken items of spherical equipment, calculated on the composition of the crew of 1135 people (SAMR, f. 300, d. 1, c. 583, p. 176). In addition, it was proposed to expand the list of orders to Swedish firms without intermediaries

to meet the needs of the Maritime Ministry, which could facilitate the unrestricted placement of orders and their shipment for export outside Sweden, as the government of that country, as a rule, has put obstacles to the export of military equipment, if it was carried out at the initiative of the intermediary firms (Russian State Archive of the Navy – RSAN, f. 441, d. 1, p. 59, p. 188).

Nevertheless, despite all the measures taken, tangible failures in counterparts' supplies already by November 1914 forced the Maritime Ministry to agree with the delay in the transfer of readiness for battleships. On February 22, 1914, in a memorandum of the director of the «Rossud» plant, M. Dmitrieva noted that despite the extraordinary delays in the delivery of ship's steel and the limited number of workers, it was possible not only to launch the battleship «Empress Maria», but also to make a significant part of the body set battleship «Emperor Alexander III». At the same time, the monthly capacity of workshops of the plant reached 120 thousand pounds (SAMR, f. 300, d. 1, c. 124, p. 22–25).

The desire to accelerate the timing of the launch of new ships, caused by the war, in the context of hostilities, led to changes in plans of work due to redistribution of orders for compensation ordered equipment abroad (Ganelin, 2004b, p. 495). The same desire was due to the appointment of special prizes for the payment of emergency expenses for enterprises that participated in the construction of Black Sea battleships-dreadnought (Ganelin, 2004a, p. 547).

The state actively financed the purchase of ships mechanisms and devices abroad, but the principle requirement of the Maritime Ministry remained the maximum possible use of domestic materials, weapons and ammunition. Therefore, during the construction of the line ships, artillery cannons were manufactured and supplied by the Obukhiv Plant, the machines and mechanisms of the main caliber towers were manufactured by «Naval» and the Putilivsky plant, plates and devices for defense – Izhorsky plants, fire control devices – the plant «G. A. Lessner» in Petrograd, steering machines and spikes – Sormovsky plant, boats – Kronstadt port. The main boilers of the «Empress Maria» were supplied by the Kharkiv steam locomotive plant, and for the «Emperor Alexander III» they were made at «Rossud» (Kulikov, 2014b, p. 112–113).

The Russian association of artillery plants commissioned by Mykolayiv shipbuilding factories produced 8" guns with a length of barrel of 50 caliber, 12" guns with a barrel length of 40 calibers; Metal factory – four casemate machines for 8" guns with length of barrel 50 calibers, three casemates for 6" guns with a length of a barrel of 45 calibers, five-casemate machines for 120-mm guns with a length of a barrel of 45 calibers, towers for 12" guns, day and night periscopes; Perm factory – 6" guns with a length of the barrel of 45 caliber, the Obukhiv factory – sights of the system of Vickers, 6" high-explosive shells; Firm «Pol Giro» – 8" high-explosive shells; Sevastopol port – 75 mm guns, Joint Stock Company «Geysler and K°» (RSAN, f. 401, d. 6, c. 751, p. 1–2).

At the same time, to expedite the execution of works on the construction of ships for the inspection of private enterprises in order to identify the machines for guns that are suitable for immediate use, were sent artillery officers, who determined the terms of implementation of the requisites.

To accelerate the construction of ships on February 19, 1915. The Main Department of Shipbuilding has decided to streamline the procedure for review and approval of drawings, both for ships as a whole, and for separate ships mechanisms. In accordance with this document, the ship's general drawings should have been submitted by the factories before starting

construction on a scale in accordance with the specification of the General Directorate of Shipbuilding. After reviewing them in the departments, they were to be signed by the heads of departments and the head of the Main Department of Shipbuilding, and then sent to the Marine Minister for review and approval. Drawings and calculations of the main parts of ships and their general layout were approved by the departments of the Main Department of Shipbuilding. All drawings of the placement of devices, in consideration of which the practice of their application and operation was to be taken into account, should have been submitted to the Commission for the supervision of the construction of the ship, where they were approved. And all other detailed and working drawings had to be approved directly by the observers who followed the construction of the ships. It was pointed out that pipeline schemes necessarily had to be accompanied by drawings of pipes, valves, clinkers with indication of the color of each type of pipes as marking them as intended. All drawings of parts of the body, mechanisms and devices should be accompanied by characteristics of the most important elements for accelerating the consideration and approval. At the same time, the obligatory element of preparation of drawings was the indication of the weight of each individual detail. All the remarks on the drawings and calculations of parts and mechanisms of ships had to be removed by the factories as soon as possible, which was evidenced by the signing by their representatives of the relevant commissions. Drawings of separate mechanisms had to be sent to the Main Department of Shipbuilding in the event that no agreement was reached between the factory and the commission supervising the shipbuilding, or additional allocations were required. If during the construction of ships, it would be recognized that it is necessary to change the drawing of the general arrangement of ships mechanisms, the new drawings must have been submitted for consideration and approval to the Main Department of Shipbuilding (RSAN, f. 401, d. 6, c. 1310, p. 1–4).

In March 1915 it was planned to complete the construction of the battleship «Empress Maria» on May 15, 1915, to carry out mooring tests of the battleship «Empress Catherine II» – about July 15, the «Pylkiy» and «Pospeshny» miners – about April 15, the submarine «Marj» had to be prepared for tests already on March 20, «Narval» – about May 10, «Kashalot» – about June 1, «Keith» – until July 1, 1915 (RSAN, f. 401, d. 6, c. 851, p. 1).

Much attention was paid to the construction of not only battleships but also destroyers: the specifics of the conduct of hostilities on the Black Sea provided for their active use to block the transport of the enemy along the Anatolian coast. The miners were also used to block the port Zonguldak, which was used for the shipment of coal by the Turks. On March 17, 1915, the Maritime Ministry signed a contract with the Mykolayiv Society of factories and shipyards for the construction of eight destroyers with a full speed of 33 knots (RSAN, f. 401, d. 6, c. 875, p. 89).

In addition, the tests of these ships were supposed to be carried out at wind power of no more than 3 points, and after the approval of the drawings, no changes in the design of the destroyers were prohibited to be introduced without the consent of the Maritime Ministry. All parts of ships' hulls, mechanisms and separate devices were to meet the requirements of the relevant specifications and should be executed «from materials of Russian descent» (RSAN, f. 401, d. 6, c. 1321, p. 80).

All parts of the body and mechanisms for the ship's equipment were to be fitted to the «Derzky» type destroyers and be constructed of materials of «Russian descent», except those parts that were not manufactured in Russia, and the adjustment of their production would lead to delay in the delivery of ships. Mykolayiv Society of factories and shipyards received

the right to purchase materials for blades of turbines, blade forgings, as well as additional mechanisms purchased for demolition-type «Derzky», purchased abroad without reducing contract value. Regarding these parts, the right to make an order to acquire them abroad with the mandatory agreement of the order with the Shipbuilding Council was granted. The specifics of the contract provided payment by the Mykolayiv Society of factories and shipyards of all customs duties and fees necessary for the receipt of ordered mechanisms, as well as the prohibition on sending all materials of the specification on the destroyer to executors of orders abroad to maintain the secrecy regime. It is important that the guns and devices for attaching them to the ships (up to the corresponding base bolts), as well as equipment for transmitting signals were provided exclusively by the Maritime Ministry and could not be ordered abroad. At the same time, the installation of the specified equipment was carried out at the expense of the Mykolayiv Society of factories and shipyards and did not provide for the definition of additional financing (SAMR, f. 297, d. 1, c. 322, p. 64–70).

In case of unpreparedness of the floating dock of the Company to carry out works stipulated by the contract, it was planned to use the corresponding dock from Sevastopol at the expense of the Mykolayiv Society of factories and shipyards. Thus, for the built in accordance with the approved drawings, the destroyer, the Maritime Ministry had to pay 2 million 200 thousand rubles, and the total contract amount was 17 million 600 thousand rubles. Moreover, when the Marine Ministry would consider it necessary to refuse the establishment of certain mechanisms or devices on ships, the corresponding amount of their value would be deducted from payment (SAMR, f. 297, d. 1, c. 185, p. 69–76).

During the war, a revision of the estimates for the construction of vessels, including in connection with the introduction of changes in the construction of ships. For example, for the work of the «Empress Maria» and «Emperor Alexander III», the «Rossud» plant was initially allocated 125 thousand rubles for the execution of work related to the changes in the defense of battleships (RSAN, f. 401, d. 6, c. 850, p. 4). However, later this amount, according to the Department of Military and Maritime Accounts, increased to 470 thousand rubles (RSAN, f. 401, d. 6, c. 1283, p. 11). The problem of calculating the amount of funding for ship construction programs for the Russian fleet was the organization of their design and ensuring compliance with the design calculations of ships of one series in the absence of well-established work of research stations. Mykolayiv shipyards did not have enough qualified specialists to design battleships-dreadnought. This forced them to attract specialists from Baltic factories to work.

However, due to an error in the calculations, «Empress Maria» received a large divergent on the nose, which worsened even without that bad seaworthiness. To remedy the situation, it was necessary to reduce the ammunition of two bow-guns of the main caliber to 70 shots per barrel instead of 100 by state, on the battleship «Empress Catherine the Great» changed the centering of the weight behind the gangways with the transfer of the center of gravity of the ship to the stern, and on the battleship «Emperor Alexander III» to this end, they took off two 130 mm nose guns. The desire to improve the ships of one series or correct the defects found in the design led to certain changes in the design and the corresponding changes in estimates, which, for example, were shown by the specification of the mechanisms of the battleship «Empress Catherine the Great» (SAMR, f. 297, d. 1, c. 862, p. 1–4). Linear ships of the type «Empress Maria» differed in displacement («Empress Maria» – 22 thousand 600 tons, «Emperor Alexander III» – 22 thousand 600 tons, «Empress Catherine the Great» – 23 thousand 783 tons), by means of leveling trim, methods of fastening armor and its type, etc. This led

to the allocation of additional funds for the completion of ships, their redistribution between contractors and violation schedules of the planned work. In addition, the desire to accelerate the timing of the launch of new ships caused by the war, in the context of hostilities led to changes in plans of work due to redistribution of orders to compensate ordered equipment abroad (Ganelin, 2004b, p. 495).

Another reason for making significant changes to the design of the ships of the «Empress Maria» was the results of classified tests of the strength of the armor of new battleships, carried out before the war, when a corps of the battleship «Gangut» was cut into the body of the old battleship «Chesma». As a result of the tests, it turned out that the 305-mm high-explosive projectile of the 1911 model pierced the main armored belt of the Gangut baton from the cableway 63, and at more distances distorted the armored base, breaking the hermeticity of the body. Both armored decks were too thin – the projectiles not only pierced them, but also crushed into fragments, which caused even more destruction. That is why the armored protection of the Black Sea battleships was strengthened, and the fourth ship of the «Empress Maria» type had a significantly increased displacement and defense, which, accordingly, increased the amount of funding for its construction. It is worth pointing out that the adoption of its time as the basis of the project of battleships of the Design Bureau of the Baltic Plant under the leadership of I. Bubnov with a reduced thickness of armor was the result of the existence of a powerful lobby with the support of academician O. Krylov, who was both the chairman of the competition jury and co-author of the project (Korolev, 2011, p. 79–80). In his memoirs, the academician emphasized that France, which provided Russia with a loan for the construction of ships, opposed the adoption by Russia of the project of the German shipyard «Blohm & Voss» due to the unwillingness to invest about 500 million rubles in gold in the development of the German shipbuilding industry. The result of such a lobby was the investment of significant funds for the re-equipment and modernization of Russian battleships, based on which was not enough perfect design of the ship with a high speed, powerful armament, but extremely weak armor protection (Taras, 2002, p. 228).

That is why, under the contract of August 30, 1914, with the «Society of Nikolaev factories and shipyards» on the construction of the ship «Emperor Nikolay I», this battleship with the preservation of basic weapons in the form of twelve 305-mm guns had significantly increased armor protection, which increased its displacement before 27 thousand 800 tons. The weight of the armor without the towers reached 9 thousand 417 tons or 34,5% of the design displacement. In addition, reinforced the support base under the armor, and most importantly – all armor plates were connected with vertical dangles of the type «double tail swallows», which turned the belt into a monolithic 262-mm armor. Behind him was a 75 mm skid armor deck and puncture bulkhead of the same thickness, which increased the total thickness of armor protection to 337 mm. But such improvements significantly increased the cost of building a ship. In addition, the financing of the construction of the battleship «Emperor Nikolay I» significantly influenced the fact of Russia's participation in hostilities. The contract provided that the total amount of ordering equipment for battleship abroad should not exceed 2 million rubles, and in the case of the submission of calculations for exceeding this amount, the difference should be compensated by the profits of the owners of shipbuilding plants with a reduction in contract value of the construction of the ship. The total cost of the battleship, constructed in accordance with the contract drawings, should be 22 million 500 thousand rubles. This amount did not include the cost of mines, guns, airborne machines, armor, artillery fire control devices, wireless telegraph, seagoing tools and secret signaling

with appropriate wires, and any deviations from the project were allowed only if agreed with the Maritime Ministry. Shipbuilders were obliged to keep an account of the weight of all elements of the ship to prevent its overload, which was controlled by the relevant authorities (SAMR, f. 297, d. 1, c. 272, p. 82–92).

In wartime, the project of shipbuilding funding often had to be revised due to the increase in the cost of materials and wages. Thus, the electric equipment of destroyers of the type «Derzky» was ordered to the company «General Electric Company» under a contract from October 12, 1912, for the amount of 54 thousand rubles for a destroyer without taking into account the cost of installation on ships of electric tachometer. And in a series of destroyers such as «Ushakovsky», the overall increase in the price of electrical equipment under a contract from October 26, 1915 was about 75 thousand rubles and reached 129 thousand 935 rubles for a destroyer (SAMR, f. 297, d. 1, c. 84, p. 47).

On August 29, 1914, a contract was signed with the Russian Shipbuilding Company in Mykolayiv for the construction of two light cruisers of the «Admiral Lazarev» type. Incidentally, the amount of shareholders' profits in the construction of cruisers was laid down in accordance with a contract of 10% (SAMR, f. 300, d. 1, c. 400, p. 10–12). On March 17, 1915, a contract was signed with the «Society of Nikolaev shipbuilding and shipyards» for the construction of four submarines of the «Bars» type with a surface displacement of 650 tons. The cost of one submarine under the contract was 1 million 665 thousand rubles, and the total contract amount was 6 million 660 thousand rubles. This amount did not include the supply of Whitehead mines, radio telegraphs, compasses. In particular, as in other cases, the payment of fees for equipment imported from abroad was relied upon by the contractor (SAMR, f. 297, d. 1, c. 322, p. 48–54).

On April 15, 1915, Emperor Nikolay II arrived in Mykolaiv, accompanied by the Minister of the Sea I. Grigorovich, who visited the plants «Rossud» and «Naval». At «Rossud» to the emperor were represented the managing director of the plant M. Dmitriev, the chief ship engineer-colonel L. Koromaldy, the plant manager K. Vaschalov and at that time the engineer-builder of the battleship «Empress Maria» F. Ryadchenko. The chairman of the board, «Rossud», Professor Lieutenant-General V. Ivanov, reported that the battleship was built in three years, or seven months earlier than planned, and stressed that «Rossud» proved this construction that «on the strength of its equipment and the working capacity of its employees, including workers, it is not inferior to any foreign enterprise in this industry». Representatives from the workers attended the meeting, and the worker Belov made a speech and received a gift from the emperor – a watch with a coat of arms. Nikolay II was photographed on the deck of «Empress Maria» with shareholders «Rossud», factory administration and crew. He then visited «Naval», where he visited the boiler house and tower shops, forge, mechanical, steel and turbine industries and was present at the laying of a new battleship. In addition, Nikolay II visited a hospital, based on joint funds «Rossuda» and «Naval».

The visit of Nikolay II to Mykolayiv contributed to the fact that on April 20, 1915, the Maritime Ministry had an additional contract with the Mykolayiv Society of factories and shipyards to accelerate the construction of the battleship «Empress Catherine the Great», according to which the ship was to be fully prepared by June 20, 1915. In case of fulfillment of this condition, shipbuilders were paid an additional 1 million 250 thousand rubles. In the case if the ship will not be completed before the stipulated term from the amount of the prize was calculated the amount of the penalty, which should not exceed 750 thousand rubles. In addition, before leaving the ship from the factory, it was provided that the Maritime Minis-

try's commission had to draw up an exact list of works in accordance with the established drawings that would have to be fulfilled by the contractor when the ministry had the opportunity to return the ship for their execution. Under the terms of the contract, the customer did not pay the amount of 1 million rubles of the total cost of the ship, as a means of ensuring the performance of warranty obligations by the contractor. In the event of an accident or death of the ship or failure to return it to the plant within 12 months for the performed contract work, shipbuilders were paid all due funds, except for the payment of penalties for delayed performance of orders for certain mechanisms of the ship (SAMR, f. 297, d. 1, c. 322, p. 95).

The forms of financing the construction of the battleship «Empress Catherine the Great» were one of the keys to accelerating the construction of the ship, provided that the quality of the work is carried out. Representative of the company «Vickers» Johnsas, who attended the factory during the construction of the ship, on January 19, 1916, in a letter to Y. Yurienev noted that European specialists appeared to be unable to carry out such a large amount of work for such a short time. After all, within the framework of construction, 23 thousand 400 tons of steel, equipment and guns were manufactured and installed in the conditions of delays in the supply of materials, reducing the qualifications of workers. The letter emphasized that the pace and quality of the construction of the battleship «Empress Catherine the Great» allowed to assert that the Society of Mykolayiv factories and shipyards had a record for Russia in the construction of ships of this type (SAMR, f. 297, d. 1, c. 358, p. 286–286 v).

On October 26, 1915, the «Naval» plant appealed to the Council of Ministers with a request for an advance of 4 million rubles (RSAN, f. 401, d. 1, c. 33, p. 12). The reason for the appeal was the inability to repay loans and the lack of working capital. The debt of the Society of Mykolayiv factories and shipyards to Russian and foreign lending institutions amounted to July 1, 1915 – 21 million 205 thousand 346 rubles, On August 1 – 22 million 82 thousand 407 rubles, September 1 – 14 million 277 thousand 402 rubles, on October 1 – 16 million 549 thousand 232 rubles, on October 13 – 17 million 882 thousand 586 rubles (RSAN, f. 401, d. 1, c. 33, p. 15). It was decided to give the factory «Naval» an advance of 2 million 500 thousand rubles at the expense of the amounts intended to be paid under the contract for the construction of the ship «Empress Catherine the Great». At the same time, it was provided that if the Naval Ministry would need to repair the ship's mechanisms during the warranty period, then the corresponding costs should be reimbursed by retaining amounts from the Marine Ministry's previous orders (RSAN, f. 401, d. 1, c. 33, p. 117–117 v.).

In December 1915, a final calculation was made with the Nikopol-Mariupol Society for supplying shipbuilding factories of armored slabs for battleships-dreadnoughts. By decision of the Admiralty and the Council of State Control from December 17, 1915, it was recorded that one of the armor batches for battleship «Empress Catherine the Great» was transferred to shipyards as restored after processing, which reduced its resistance to shells by 1–2%. Taking into account this indicator of the reduction of armor stability, as well as the fact that the batch was returned to shipyards after processing, the Admiralty determined that the armor was considered to be manufactured outside the contract, which allowed it to set the appropriate prices for it, namely 116 thousand 33 rubles for the party number 5 armor for the battleship «Empress Catherine the Great». It should be noted that the fact of the return of the armor after processing was established by the Acting Head of the General Directorate of Shipbuilding Vice-Admiral of Artillery V. Girs and Major-General of the Marine Artillery Corps V. Fedorov (RSAN, f. 401, d. 6, c. 1351, p. 1–1 v.). However, during the testing of the first series of armored 300-mm plates from cropping cemented steel for the bow and fence towers of the

battleship «Emperor Nikolay I» there were no deviations from the norms, which allowed to successfully use the entire batch (RSAN, f. 401, d. 6, c. 1352, p. 12). And already in February 1916 it was decided to accelerate the construction of this ship and order condensation devices for turbogenerators in England firm «Vir» (RSAN, f. 401, d. 6, c. 1352, p. 5).

In December 1915, a contract was signed with «Rossud» for the construction of forty landing barges, provided to the supply of a corresponding number of motors by the Maritime Ministry. «Rossud» had to install these engines according to the specifications and requirements of the customer. At the same time, parts of the cases and separate devices were to meet the requirements of the specification and built from «domestic materials» (RSAN, f. 401, d. 6, c. 1280, p. 104).

At the end of 1915 – early 1916, the merger of not only the administrative structures of «Naval» and «Rossud» was rather noticeable, but also the formation of a «portfolio» of orders for enterprises. In 1915, out of ten members of the «Naval» government and nine «Rossud», four were part of the board of both companies at the same time. The board of both plants was in St. Petersburg in one house, and it was common case management (SAMR, f. 297, d. 1, c. 316, p. 20–21). Russian authorities have repeatedly expressed the idea of the need for a full merger of enterprises, provided «the takeover» «Naval» by «Rossudom» (RSAN, f. 401, d. 6, c. 1280, p. 57). This was due to the «irrationality» of many departments with large staffs. It was suggested to leave only two departments – office work and accounting, – which would serve both enterprises (RSAN, f. 401, d. 6, c. 718, p. 4).

Shipbuilding Mykolayiv complex was a technologically rather complex formation, which included foundry and forge production, mechanical workshops, case shops with a modern machine park, lifting and transport constructions, overpasses, pier, floating docks. An important role was played by scaffolds, piles and triggers. All of this equipment allowed the construction of ships with a maximum displacement of 25 thousand tons, including battleships and linear cruisers dreadnought type, light cruisers, destroyers (including the latest ones with the use of turbine engines), submarines and submarine mines (it is in Mykolayiv was built the world's first underwater mine barrier «Crab»).

In April 1916, the value of the products of the blacksmith and foundry departments of the «Rossud» plant was determined, among which there were steering frames, large shaft, bracket shafts. At the same time, it was recognized that it is possible to manufacture forgings of machines for 12", 14", 16" and larger guns (RSAN, f. 401, d. 2, c. 1154, p. 1–2). The possibility of manufacturing such products, despite the above-mentioned increased complexity of technical support, showed both the high professional level of the company's employees and the availability of equipment that made possible the execution of such works.

With a great tension of forces worked the factory «Naval» too. On May 1, 1916, on the battleship «Emperor Nikolay I», according to the contract and approved drawings, 6562 tons of steel were installed, which was 89% of the contracted trigger weight. And although under the terms of the contract from August 30, 1914, the fifth payment on the battleship was to be issued after the ship's descent to water, provided the body was ready for at least 60%, but guided by the instructions of the Main Department of Shipbuilding of August 8, 1915, No. 12033 was resolved to issue the factory «Naval» 1 million 780 thousand rubles provided to the maintenance of this amount of 886 thousand rubles, which was issued as a payment on the certificate of August 19, 1915. Thus, on May 6, 1916, it was decided to issue «Naval» 894 thousand rubles in the calculation for the fifth payment on the battleship «Emperor Nikolay I» (RSAN, f. 401, d. 6, c. 1284, p. 7).

On May 25, 1916, the Marine Ministry signed a contract with «Rossud» for the construction of eight submarines: four «Holland» type with a surface displacement of 952 tons and «Fiat-San Georgio» with a surface displacement of 920 tons. The cost of building a submarine of the type «Holland» was 4 million rubles, and «Fiat-San Georgio» – 3 million 800 thousand rubles with a total contract amounting to 31 million 200 thousand rubles. The Maritime Ministry retained the right to reduce the price of the contract in the event of refusal to install certain equipment on submarines and formed a commission to monitor the quality of the work (SAMR, f. 300, d. 1, c. 694, p. 9–16).

At the same time, there was a controversial issue regarding the use of «Rossud» scrap pig iron, which was located on the territory of the Mykolayiv sea port and was not used. The management of the plant proposed to use it for the manufacture of parts of new transport using the machines to accelerate the manufacture of parts of the battleship «Emperor Alexander III». It was supposed to use a combination of machines designed by engineers «Rossud», for mass cutting and threading of reinforcement (SAMR, f. 300, d. 1, c. 583, p. 71). However, the Main Directorate of Shipbuilding refused to «Rossud» to sell scrap pig iron and expressed its transfer to its pipe plant (SAMR, f. 300, d. 1, c. 583, p. 72).

In 1916 the «Rossud» plant managed to prove the readiness of the ship «Emperor Alexander III» to 92%, as during the year it was possible to transport the main mechanisms of the ship from England through Arkhangelsk by the water systems to Mykolaiv. The body and mechanisms of the ship were insured for 1 million 264 thousand rubles (SAMR, f. 300, d. 1, c. 244, p. 129). The size of the insurance for «Empress Maria» was 1 million 269 thousand rubles (SAMR, f. 300, d. 1, c. 244, p. 192–192 v.). The «Naval» plant was scheduled to complete the construction of this ship until the spring of 1917. By December 1, 1916, the construction of the lightweight cruiser «Admiral Nakhimov» was up to 78,7%, and «Admiral Lazarev» – up to 71,7%. The «Naval» plant ensured the readiness of the «Admiral Istomin» cruiser to 54,5%, while the «Rossud» plant proved the readiness of the «Admiral Kornilov» cruiser to 54,9%. During 1916 the destroyer «Fidonisi», «Kerch», «Hadjibey», «Kaliakria», «Cerigo», «Corfu» and «Levkas» were launched into the water. In 1916, the last of the submarines of type «Holland» was put into operation, with a displacement of 630 tons, built by Nevsky Shipyard in Mykolaiv. The Society of Mykolayiv's plants was launched into the water of the submarine «Orpheus» with the readiness to test until January 1, 1917 (Ganelin, 2004c, p. 631–632). However, in September 1916, there was a fire on the cruiser «Admiral Nakhimov», the cause of which was not established. To reimburse the losses involved representatives of the insurance company «Russia», where the ship was insured (SAMR, f. 300, d. 1, c. 583, p. 124).

In order to avoid fires on the battleship «Emperor Alexander III» from November 1, 1916 new rules of fire safety were established. According to them, the duty of a regular non-commissioned officer was the daily roundabout of the ship after the completion of work to identify unmixed flammable materials, monitoring mooring, switching off electrical lighting, monitoring workers' compliance with the rules of smoking, obtaining information on the ship and nearby it firefighting equipment. In addition, it was supposed to monitor the roll and trim of the ship. In the case of approaching a ship of boats, boats and other waterways, another non-commissioned officer had the right to stop them, including with the use of weapons. Of all detected deviations from established norms, a non-commissioned officer was required to report to a regular officer (SAMR, f. 300, d. 1, c. 679, p. 2).

In addition, to strengthen the protection of ships, additional measures were taken in order of the plant administration of November 17, 1916. According to this document, entry to the

ship not only to third parties, but also officers, even with the support of observers, was not allowed without permission. The lower ranks of the ship's warehouse, including the conductors, were to receive special passes. In the case of an attempt to carry officers or lower ranks on ships of any items or things, they should have been brought for care. In the event of a refusal, the officers could leave their belongings in the appropriate premises without the right to carry them on board the ship. During the work at the entrance ladder there was a permanent non-commissioned officer from the court team (SAMR, f. 300, d. 1, c. 679, p. 18).

The dynamics of shipbuilding capacity during the war years affected the number of employees at enterprises. Thus, at «Rossud» in 1914 2939 people worked in 1914, 2992 in 1915, 3901 in 1916, and 3991 in 1917 (Kulikov, 2014b, p. 113).

To provide shipbuilding plants with a labor force in 1915, a special meeting on defense decided to allow work to be done for women and adolescents. The Main Department of Shipbuilding, on the orders of the Assistant to the Marine Minister, recommended the widespread use of the named categories of workers to accelerate the construction of ships (SAMR, f. 300, d. 1, c. 470, p. 3).

However, on July 17, 1915, the announcement No. 10 of the «Rossud» plant administration was published, stating that in some areas of the empire there were cases where workers put forward demands that could not be fulfilled, «allowed themselves to leave their jobs». In this regard, the workers «Rossud» reported that self-abandonment of work became the cause of liability in the form of imprisonment for a period from 1 month to a year, arguing that such actions could be qualified as «weakening the activities of factories that manufacture items for needs army and navy and thereby threatened the security of the state» (SAMR, f. 300, d. 1, c. 485, p. 5).

However, in spite of coercive measures, at shipyards some time managed to avoid massive disturbances at the expense of an increased level of remuneration. In addition, the need for the formation of the core of highly skilled workers to perform complex shipbuilding work, created an atmosphere of respect for them, as well as for the administration that carried out managerial functions. Despite the high level of financing for shipbuilding, the atmosphere of «unity of Mykolayiv shipbuilders» has been promoted and the relatively high rates of shipbuilding have been maintained. At the same time, qualitative performance of works was stimulated by bonuses. The relatively high rates of shipbuilding workers' work were attributed to an increase in the volume of deposit transactions between them and local banking institutions, which was observed for at least the years 1914 – 1915. The chord system of remuneration, introduced at the enterprises, has shown its high efficiency in stimulating the growth of labor productivity of workers.

However, the problem of financing the shipbuilding industry was the strikes of 1916 and the spread of rumors among workers that seizure workers had significantly increased their wages. Thus, during a strike at the «Naval» Shipyard in Mykolayiv, the wishes for the requisition of the enterprise were even before the sequestration of the Putilivsky plant. Such hopes were associated with an example of the establishment of increased wages for railway workers who were requisitioned by the government (Polikarpov, 2008, p. 484).

Yet, on January 11, 1916, a strike broke out on «Naval», which lasted until the middle of March. The commander of the Mykolayiv port on the mobilization unit on February 12 appealed to the commander of the Black Sea Fleet, in connection with the strike on «Naval», of all the military workers in the case of their calculation from the plant to be credited to the local 45th reserve battalion in Mykolayiv. But in case of restoration of the plant it was point-

ed out the possibility of returning workers to «Naval». The commander of the Mykolayiv port emphasized that accelerated strike suspension is complicated by the uncertainty of the situation of the military-lenders (RSAN, f. 609, d. 3, c. 224, p. 24–24 v). At the same time, the management of the company (and personally B. Yurienev) refused to use the mass layoffs of workers and send the «guiltiest» strikers to the army, stressing that he preferred a «peaceful resolution» of the conflict with the workers. B. Yurienev appealed to the Chief of the Main Maritime Economic Administration to avoid the lockout and expressed his hope for an accelerated strike (RSAN, f. 401, d. 6, c. 1304, p. 152). At the same time, all calculated workers (namely – 3473 persons) were called and sent to spare battalions (Russian State Historical Archive – RSHA, f. 1276, d. 12, c. 295, p. 1).

For taking part in the strikes, part of the workers was dismissed by the management of the factories. To replace them, the administration was forced to appeal to the Supreme Commander-in-Chief with a request to release from the linear parts and transfer to the construction of ships of skilled craftsmen and workers who served in the army. Such a transfer was motivated by the desire to ensure the timely introduction of ships into operation. In particular, in the vast majority of cases, the appeal of plant managers was satisfied in a relatively short period of time (SAMR, f. 297, d. 1, c. 150a, p. 192).

In addition, in early November 1916 new norms of additional soldering for workers during the war were set: for married masters, 5 kopecks per hour for unmarried persons – 4,5 kopecks; for the workers who carried out roughing work (married men, married women, widows and widows with children) – 4,5 kopecks, and for the number of unmarried men, unmarried women, childless widows, widowers and students who performed rough work, the size of additional soldering installed in the amount of 3 kopecks per hour (SAMR, f. 300, d. 1, c. 679, p. 10).

On December 31, 1916, the plant management at the order of the board of «Rossud», with the agreement of the local factory inspector, organized a subscription of employees and workers for a three-billionth 5,5 percent short-term military loan with the opening of a collective bank account in the Mykolayiv branch of the State Bank for this purpose. The loan was to be repaid within nine months with equal monthly salary deductions from employees and employees starting from January 1917. Persons wishing to take part in this loan should contact the chiefs of the departments with the subsequent submission of data to the chief accountant before January 5, 1917 (SAMR, f. 300, d. 1, c. 644, p. 1).

In February 1917, the board of the plant «Rossud» decided to organize the assistance to workers who received a profit in 1916 more than 850 rubles in the case of filing returns on profits received. It was noted that there were a lot of such workers at the plant, therefore the reception of applications was organized in all workshops of the plant (SAMR, f. 300, d. 1, c. 644, p. 11).

Conclusions. In general, the financing of shipbuilding enterprises shows the scale of investment in the development of the shipbuilding industry. In favor of such a statement is that, for example, the director of «Rossud» already in 1914 considered the production capacity of the enterprise sufficient to perform the tasks. Problems in the area of financing created a rise in the cost of labor, increased payment for certain materials and their transportation by rail. The personal interest of the imperial family and a number of high-ranking officials in the work of shipbuilding factories, as their shareholders, facilitated the organization of production financing. At the same time, the value of Russian dreadnought was higher than their British counterparts. For example, the powerful dreadnoughts ordered by Turkey in England

in 1911 cost 15 million rubles every. And dreadnoughts, built in the Russian Empire, cost 21 million rubles every. In addition, unlike the Russian fleet, Turkish sailors could get British Dreadnought in 2–3 years after the signing of the contract. German dreadnoughts cost about 16–18 million rubles. For the construction of the German «Nassau» ship it took 2 years 2 months, while for the construction of the battleship «Emperor Alexander III» – 5 years, and the battleship «Empress Maria» – 4 years. In addition, a special commission that took the battleship «Empress Maria», identified a number of shortcomings of the ship, among which was high enough temperature in the places of gun storage (perhaps that this caused the death of the ship in October 1916). In spite of the huge expenses of the state for the needs of the naval department, the Russian fleet never received enough warships until 1914. The Russian empire, having further spent more than the other countries on the construction of the fleet, at the beginning of the war received less new warships (Popov, 2010, p. 102).

The rates of development of funds by shipyards at least until the end of 1916 remained rather high. Execution of orders created additional jobs and contributed to the accumulation of experience in the construction of state-of-the-art ships and their separate mechanisms. And the existence of a restriction on the purchase of materials and mechanisms from abroad for the construction of ships encouraged the development of related industries: electrical, chemical, metallurgical.

It turned out that the shipbuilding industry, which acted as an accelerator for related industries, is extremely vulnerable to the breach of industrial ties, as equipment for ships was manufactured in different regions of the Russian Empire. Excluding the possibility of organizing a closed cycle of ship production in a relatively small area due to the extraordinary complexity in concentrating the necessary production capacities, the system for manufacturing ships and equipment for them required clear operation of the entire economic mechanism.

High-tech construction of the «Empress Maria» battleships, which included the design of a layout scheme, the manufacture of armor protection, trimming towers and 305-mm guns with a large length of the barrel, as well as power plants that used both coal and oil as fuel, proved the correspondence of the shipbuilding factories «Naval» and «Rossud» to the world standards of shipbuilding at that time. And fulfillment of orders in difficult military conditions is a high level of organization of production and outstanding organizational skills of the heads of enterprises, and first of all M. Dmitriev and B. Yurienev.

Designers at shipbuilding plants worked at a high level. This is especially true for the specialists of the «Naval» plant, where the project of a linear ship was created, the basic principles of its construction were implemented in the leading countries of the world in the second half of the 30's – in the early 40's of the twentieth century. The designers managed to determine the prospects of increasing the displacement of the future battleships, the linear arrangement of the main caliber artillery, its type and the caliber of 405-mm along with the delineation of the distances of the future confrontation of the ships, as well as the basic principles of the organization of armor protection with the vertical placement of rectangular armor plates. The high level of execution of design work was also found in the design of turbine destroyers, as well as landing ships, which were built in large series. At the same time, designing ships was often confronted with bureaucratic obstacles on the part of senior government leaders, not least due to corruptions of high officials. This led to errors and disadvantages in the construction of ships, the elimination of which required the additional attraction of public funds.

A positive role in the organization of the work of Mykolayiv's shipbuilding enterprises was played by the introduction of a chord system of remuneration and premiums for early

qualitative execution of works, which allowed to ensure a high level of motivation for the implementation of work primarily by highly skilled workers. We also note the support of the married workers of factories due to the increased volume of additional rations for them.

Creation of a powerful industrial base for shipbuilding was carried out by the royal government with the attraction of foreign specialists and capital. First of all, it concerned the modernization of the «Naval» plant. At the same time, after the completion of the main works, the influence of both representatives of the royal family and senior executives of the country led to the displacement of foreign capital and the concentration of shares in shipbuilding enterprises in the hands of the subjects of the Russian Empire.

The concentration of production, and first and foremost, the interaction and specialization of Mykolayiv shipbuilding factories «Naval» and «Rossud» allowed to implement large-scale projects in the field of shipbuilding. These include serial production of battleships, dreadnoughts, cruisers, turbine destroyers and submarines.

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