

## The 175th Anniversary of the Russian Navy Hydrographic Service

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On 13 November 2003 the Russian Navy Hydrographic Service will celebrate its 175th anniversary. To commemorate this event this article presents some of the more significant developments in the history of Russian Hydrography.

At the end of the XVII century Russia was a vast empire, its land possessions stretched from the Arctic Ocean to the Black Sea and from Chudskoye Ozero and Ladozhskoye Ozero to the Bering Sea in the west and the Sea of Okhotsk in the east. At the same time Russia was cut off from the Baltic and Black Seas through which the shortest and most convenient commercial routes passed. These circumstances formed the basis for Russian politics and reforms initiated by the most successful reformer of the Russian State tsar Peter I. The creation of the Navy of the State was one of these reforms.

Peter I was fully aware of the need to ensure the safety of navigation for the young fleet which was growing up. Thus, it was then that regular hydrographic research, as well as compilation and publication of nautical charts began. The Atlas of Reka Don was compiled 'under his own supervision' of Peter I, and it was followed by the Chart of the Eastern Part of the Sea of Azov which was published in 1701. Later on other Russian charts of the Black Sea and the Sea of Azov appeared.

Twelve nautical charts for the Gulf of Finland were prepared from studies carried out in the Baltic Sea. In 1714 the marine survey of the east coast of the Caspian Sea was commenced, and in 1720 the first nautical chart was published. Peter I presented this chart to the Paris Academy of Sciences and was elected a Member of Honour of that institution.

From 1725 to 1728 the Kamchatka Expedition led by Bering carried out the survey of the north-east coast of Asia from Reka Kamchatka to Mys Dezhnyova, and in 1729 the chart for this region was published.

When Peter I died the hydrographic surveys on the Baltic Sea continued under the guidance of A. I. Nagayev. The surveys resulted in the Atlas of the whole Baltic Sea including the Gulf of Finland and the Gulf of Bothnia released in 1756. In the period 1726 – 1727 the detailed survey of the west coast of the Caspian Sea was carried out, and in 1731 the Atlas of the Caspian Sea was published.

At that time the overall management of marine expeditions and hydrographic and



cartographic activities of the Navy were carried out by the Admiralty Collegium, the supreme administrative body of the Navy, established by Peter I in 1718.

In 1732 the Admiralty Collegium organised the second expedition to 'visit America' and survey the coasts of the Arctic Ocean. This is known as the 'Second Kamchatka Expedition'. In the Far East the Expedition worked under the command of V. Bering and A. I. Chirikov for 9 years (1734 – 1743) and made great progress. *Under extremely hard conditions they surveyed the north-west coast of America and numerous islands of the North Pacific, as well as the Sea of Okhotsk, Kuril'skiye Ostrova and the east coast of Kamchatka. For the first time charts of the north-west coast of North America were created.*

From 1734 to 1741 the survey of the enormously long coast from Proliv Yugorskiy Shar to the mouth of Reka Kolyma was executed in the Arctic Region for the first time by the units of the Expedition, at the cost of great effort and the lives of many of its members.

Research carried out by the North-East Hydrographic and Astronomical Expedition of 1785 – 1792 provided a significant contribution to the hydrography and cartography of the Pacific Ocean. This Expedition was led by the British citizen J. Billings, a member of Captain James Cook's voyages, who had been invited to the Russian service, while the actual supervisor of researches was G. A. Sarychev. The Expedition *made the survey of Komandorskiye Ostrova, Aleutian Islands, Kodiak Island, both coasts of the Bering Strait and a part of the Sea of Okhotsk.*

Further significant Russian discoveries and hydrographic investigations in the Pacific Ocean undertaken in the first quarter of the XIXth century are connected with the names of the outstanding mariners I. F. Kruzenshtern, Yu. F. Lisyanskiy, V. M. Golovnin, O. Yu. Kotsebu, M. N. Vasil'yev, V. S. Shishmarev and many other officers of the Russian Navy.

A major contribution to world hydrographic science was made by the First Russian Antarctic Expedition under the leadership of F. F. Bellinsgauzen and M. P. Lazarev. On 16 (27) January 1820 they sighted the Antarctic. During the voyage the expedition gathered extremely valuable scientific materials: 29 islands were discovered, physical and geographical description of the this area were made, and extensive oceanographic studies were conducted.

It should be noted that in creating the Navy, Peter I paid special attention to providing it with nautical tools. In 1721 construction of an instrument shop engaged in the production of compasses, drafting instruments, naval telescopes and other devices began. In 1752 a shop of mathematical and physical instruments was opened at the Naval Cadet Corps. Then in 1804 these shops were merged into one body – the Nautical Tools Shop.

On 2 (13) November 1777 a special cartographic drafting shop 'for drawing plans and their due maintenance' was established within the Admiralty Collegium. The event is recorded in the history of Russian Hydrography as the foundation of the Charts Division of the Navy. In 2002 the Charts Division will celebrate its 225th anniversary.

In the first quarter of the XIX<sup>th</sup> century sailing vessels were replaced by steamships. Technical refitting of the Russian Navy became an important task. One of the first endeavours of the Emperor Nicolas I was the refinement of the organisational structure of the management of the Navy. In 1827, by the Emperor's order, the Admiralty Collegium was dissolved and the Main Naval Headquarters, the supreme body of the operational control of the Navy, was established. On 1 (13) October 1827 the Hydrographer-General's Department was established within the structure of the Headquarters. It took over the management of all arrangements concerning the navigational and hydrographic support of the Navy. The history of the Head Department of Navigation and Oceanography of the Russian Federation Ministry of Defence (HDNO), and so the history of the Russian Navy Hydrographic Service, traces back to that date. Vice Admiral G. A.

Sarychev, an experienced hydrographer, who headed important hydrographic and oceanographic activities many times and was a Member of Honour of the Academy of Sciences, was appointed Hydrographer-General. Major-General F. F. Shubert, an outstanding surveyor, became Assistant Hydrographer-General and Director of the Military Topographic Depot and the Corps of Military Topographers at the same time.

Russian Hydrography organised into an independent service of the Navy and headed by the two eminent leaders gained a sound scientific and practical base for further development. This had an immediate effect on expansion of the capacity and enhancement of the pace of hydrographic work.

In 1828 an expedition led by F. F. Shubert began working in the Baltic Sea. Surveys were carried out for 10 years. When the material became available, new charts were compiled and published, and previously published charts were corrected.

From 1827 to 1832 a hydrographic expedition led by M. F. Reyneke carried out works in the White Sea. By 1834 twelve nautical charts had been compiled and afterwards the White Sea Pilot was published.

From 1832 to 1835 the survey of the coast of Novaya Zemlya was carried out under the leadership of P. K. Pakhtusov on the Barents and Kara Seas. The materials of the survey laid the basis for the XIXth century charts for that region.

The first systematic survey of the Black Sea, based on the triangulation net, was carried out under the leadership of the captain of the 1st rank Ye. P. Manganari from 1825 to 1836. In 1842, on the basis of these materials an Atlas of charts was published. The Atlas was used by mariners for over 30 years.

A substantial contribution to the development of hydrography was made by Vice Admiral M. F. Reyneke, who was the head of the Hydrographic Department from 1855 to 1859 (in 1837 the Hydrographer-General's Department was renamed). He introduced a number of improvements in the field of nautical cartography, started nautical chart updating, drew a comprehensive plan for compilation and publication of pilots, and improved the contents of nautical almanacs. The Russian Academy of Sciences elected him a Corresponding Member for his great contribution to the development of hydrography and geography.

M. F. Reyneke was successively followed in the post of the Chief of the Hydrographic Department by three directors: Vice Admiral S. I. Zelenoy, Vice Admiral G. A. Kriger and Lieutenant-General F. F. Veselago. All of them strove to broaden the Hydrographic Service activity as far as they could, but their aspirations were limited by a very reduced budget.

In 1885, during another reorganisation of the Marine Ministry, the Hydrographic Department was renamed the Head Hydrographic Department. At the end of the XIXth century and at the beginning of the XXth century the most efficient direction of the Head Hydrographic Department were under Lieutenant-General K. I. Mikhaylov and Lieutenant-General A. I. Vil'kitskiy. Mikhaylov initiated a fundamental revolution in organisational and technical re-structuring of the cartographic and publishing activity of the Department, and in particular, chart printing from aluminium printing plates was introduced. The productive 6-year (1907-1913) activity of Vil'kitskiy involved a number of important measures to expand the Hydrographic Service and to improve its functioning. These included the development of a long-term plan for hydrographic activities, the reorganisation of the cartographic section, the formation of editorial boards of pilots, charts and notices to mariners, and the establishment of the Corps of Hydrographers. In those years the amount of hydrographic activities increased, the Nautical Tools Shop was improved, and magnetic charts of the seas were compiled.

Vil'kitskiy was well aware of the necessity to combine the efforts of hydrographers all over the world to address various tasks of ensuring the safety of navigation. In spring 1908 the XIth International Congress of Navigation was held in St. Petersburg, where Fleet Colonel Yu. M. Shokal'skiy made a presentation on that issue. The Congress resolution stated, in particular:

*"The matter of the safety of navigation should be submitted, on the initiative of one of the Governments, which the Russian Government might be opportune, to an International Conference of Seamen and Surveyors for consideration."*

The Russian Marine Department, therefore, commissioned the Head Hydrographic Department with arranging the proposed Conference. The agenda was limited to three items of paramount importance for the safety of navigation:

- Drawing up sailing directions and regulations for navigation
- Uniformity in conventional signs and abbreviations on charts
- Lighting and buoyage of coasts

Belgium, Denmark, France, Germany, Greece, Italy, Japan, Monaco, The Netherlands, Norway, Portugal, Spain, Sweden, Turkey and USA responded to the invitation to take part in the Conference and sent their representatives.

The International Maritime Conference was held in the premises of the Head Hydrographic Department in St. Petersburg from 25th to 31st March 1912. Major-General Yu. M. Shokal'skiy presided over the Conference. All technical items of the agenda were reviewed and recommendations were adopted. The Conference resolutions were unanimously approved at the concluding session, and one of the resolutions stated:

*"It is desirable that the Conference on the safety of navigation should become a Permanent International Institution and be convened at the intervals not more than every 3 years. Russia could take the initiative to reach an international agreement on this matter."*

When the Conference resolutions were adopted, a delegate from France, Ingénieur hydrographe M. J. Renaud, said the following:

*"We firmly hope that the deliberations of this Conference will initiate real relationship between various Hydrographic Bureaux and that these deliberations will mark the beginning of a new era for the art of marine hydrography, for the cause of publishing of nautical documents and for the solution of the issue on marking and buoyage of navigational hazards at sea..."*

The subsequent events – the First World War and the Russian Revolution – prevented Russian hydrography from direct participation in the creation of the International Hydrographic Organization. As is generally known, the first International Hydrographic Conference, which initiated the creation of the International Hydrographic Bureau, was held in London in 1919 on the initiative of Monsieur Renaud and the British Hydrographer.

In 1913 Lieutenant-General Vil'kitskiy suddenly died and Lieutenant-General M. Ye. Zhdanko became the Chief of the Department. His activity for the most part proceeded during the First World War and was aimed at the performing of operational tasks of the Baltic and Black Seas Fleets. Hydrographic research continued only in the Pacific and Arctic Oceans where the activities had been started earlier. In 1913 the Hydrographic Arctic Ocean Expedition under the leadership of Captain of the 2nd rank B. A. Vil'kitskiy, pursuing research to the north of Poluostrov Taymyr, discovered an unknown land, subsequently named 'Arhipelag Severnaya Zemlya'. As a matter of fact, it was the last of the most significant geographical discoveries on our planet.

Generally, hydrographic coverage achieved by 1917 was satisfactory only for the Black Sea and the Sea of Asov. The vast sea areas in the North and Far East, as well as the Baltic Sea with its complex relief, required new surveys. All in all the chart catalogue numbered about 400 Admiralty charts. The greater part of them was outdated. To ensure the safety of navigation fourteen pilots and twenty five volumes of regulations for navigation for the seas surrounding Russia were published.

The Revolution of 1917 and the subsequent civil war with the involvement of armed forces of a number of countries resulted in considerable organisational and economic devastation of the country. It was only in 1923 that the Head Hydrographic Department was reorganised into the USSR Hydrographic Department which launched the systematic hydrographic surveys and compilation and publication of charts and nautical documents for mariners. Hydrographic branches for the fleets were created, and the Cartographic Branch, the Chart Printing Works, the Research Test Hydrographic and Navigation Institution and the Navigation Instruments Plant were attached to the Department.

By 1939 thirteen hydrographic vessels had been built. The Government was deeply concerned with the needs of the Navy. That ensured considerable intensification of the hydrographic activity; by 1940 the volume of hydrographic work had increased by 15 times as compared to 1913. Within 16 years (1925-1940) hydrographers surveyed considerable areas of the home waters, thus providing for a substantial increase in the amount of charts. By 1941 the collection of charts totalled 1,118 entries.

In June 1941 Germany attacked the Soviet Union. The Great Patriotic War began. It demanded that hydrographers should ensure the urgent solution of operational tasks of the command. Hydrographers provided geodetic support for gunnery and participated in the preparation and performing of landing operations. They were also engaged in reconnaissance and maintenance of ice roads and support of minelaying and minesweeping operations in the fairways. They carried out surveys at naval bases. Many of them sacrificed their lives for the sake of victory over the enemy.

Under the threat of seizure of Leningrad in 1941 the Hydrographic Department of the Navy (Chief – Rear Admiral Ya. Ya. Lapushkin) together with the Charts Division and the Chart Printing Works were evacuated to Siberia, where the production of charts and publications required was organised in the shortest time. During the War the Department produced about 900 Admiralty charts, 79 pilots, 10 atlases and a number of other nautical publications in all.

When the Second World War was over, one of the first priorities of the Hydrographic Department was the training of personnel, particularly of officer-hydrographers to carry our surveys and cartographers to compile charts. The task was fulfilled successfully.

Major efforts of the Hydrographic Service were aimed at the elimination of the consequences of the War, including mine-field trawling support and restoration of the navigational equipment destroyed. At the same time it was necessary to continue surveys in the marginal seas, to create new charts and to update the existing ones. The hydrographic fleet, which had suffered great losses, needed to be increased in size and renewed.

All these tasks was successfully fulfilled within 10 years and at an improved new technical level. Now position fixing was made by means of the newly developed radio navigation systems, vessels were equipped with home-produced echo sounders and the introduction of computerised techniques began.

At a new stage of development intensive construction of hydrographic and oceanographic research vessels began, thus allowing to increase considerably the amount of hydrographic surveys and research of the ocean and, therefore, the provision of mariners with charts and nautical publications was enhanced. By 1965 the complete collection of nautical charts and plans for all coastal areas of the country had been created, and in 1966 the programme on compilation of sailing directions for the whole World Ocean was completed.

In 1972 the Hydrographic Department of the Navy was reorganised into the Head Department of Navigation and Oceanography of the USSR Ministry of Defence (HDNO). The reorganisation pursued further quantitative and qualitative development of the Hydrographic Service. In 1970s the Soviet Union was in possession of a world collection of nautical charts. Unique charts, including multi-sheet Physiographic Chart of the World Ocean and the International Bathymetric Chart of the Mediterranean, were created. The

USSR Government acceded to the Convention on the International Hydrographic Organization (IHO), thus furthering the increase of quality of hydrographic products and the implementation of modern standards.

It should be noted that a great 'leap forward' in the development of Soviet hydrography was inspired by Admiral A. I. Rassokho, who was at the head of the Hydrographic Service from 1963 to 1985.

In early 1990s, after disintegration of the Soviet Union, the Hydrographic Service of the Navy, as all the other governmental bodies, got into difficulties. The amount of hydrographic work decreased abruptly and compilation and updating of nautical charts and publications was confronted with difficulties. Nevertheless, the Russian Hydrographic Service pursued development, though the rates were not so rapid as one would wish them to be. Thus, the first hydrographic vessel of the *SIBIRYAKOV* type was put into operation; the bathymetric chart of the Arctic Ocean (at the scale of 1 : 5,000,000) was compiled and published; the digital chart data base is being created by means of a computer-based system. 1,932 nautical charts have been digitised as of 1 February 2002, the most part of them are stored in the internal format and 132 of these charts are converted in the S-57 format. Hydrographic surveys are carried out with a view to compiling and updating nautical charts for the areas where the safety of navigation might be jeopardised with changes of the sea bottom relief.

Russian hydrographers are firmly resolved to retrieve the lost positions and to spare no effort for further perfection of the Hydrographic Service and introduction of advanced technologies into surveying and compilation of nautical charts and publications.

The long-standing history of the Russian Navy Hydrographic Service, which will celebrate its 175th anniversary this year, is the pledge of further progress.

### **Biographies**

Born in 1946, Admiral A. A. Komaritsyn graduated from the Pacific High Naval College, Vladivostok, in 1969. He was commissioned in the Navy and began his service as a Navigation Officer, Executive Officer and Command Officer in the Far East flotilla of submarines. After graduating from the Naval Academy in 1981 and the General Staff Academy in 1986 he served in several leading positions in various units of the Soviet and Russian Navy and was in command of a major flotilla of nuclear submarines. Admiral Komaritsyn has a considerable experience in the field of hydrographic support to the Navy. He is Doctor of Technical Sciences. On 1 September, 1994 Admiral A. A. Komaritsyn took up his current appointment as Chief of the Head Department of Navigation and Oceanography (HDNO) of the Russian Federation, Ministry of Defence.

Captain 1st rank (ret.) I. M. Miroshnikov was born in 1932. After graduating from the Hydrographic Faculty of the High Naval College, Leningrad (now St. Petersburg), from 1952 to 1963 he served as Hydrographic Surveyor in the Bering Sea, the Sea of Okhotsk, the Pacific and Indian Oceans. In 1963 - 1964 he was involved in oceanographic surveys in the Atlantic Ocean and in the Norwegian and Greenland Seas. In 1965 Capt. Miroshnikov was posted to the Charts Division of the Head Department of Navigation and Oceanography (HDNO) of the Russian Federation, Ministry of Defence, and was in charge of processing of hydrographic source materials for the compilation of nautical charts. In 1974 he was appointed Chief of the Hydrographic Division of the HDNO. In 1986 Capt. Miroshnikov was awarded the State Prize of the USSR (science and technology). After his retirement from the Navy in 1990 Capt. Miroshnikov is currently Deputy Chief of the Information Department of the HDNO Charts Division.

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