Shipbuilding portfolio of the Group as at 31 December 2018[1]

Hull number	Type of vessel	Deadweight, tonnes	Ice class
S922	LNG-fuelled Aframax tanker	114,000	1B
S923	LNG-fuelled Aframax tanker	114,000	1B
S924	LNG-fuelled Aframax tanker	114,000	1B
2245	MR Arctic shuttle tanker	42,000	Arc7
8006	Atlanticmax LNG carrier	82,000	-
8007	Atlanticmax LNG carrier	82,000	-
8008	Atlanticmax LNG carrier	82,000	-
131110	LNG-fuelled Aframax tanker	114,000	1B
131120	LNG-fuelled Aframax tanker	114,000	1B
Total		**858,000**	

3.3. INNOVATIVE ACTIVITIES AND R&D

3.3.1. Areas of innovative activities

Sovcomflot is a world leader in developing and implementing innovations in the field of maritime transport. The Groups is actively and consistently improving technologies and equipment, implementing international best practices, improving fleet management and enhancing the scientific potential of employees, including seafarers and land-based specialists.

Sovcomflot Group's innovative activities are carried out in accordance with the requirements and methodological guidelines of the Federal Agency for State Property Management (Rosimushchestvo), the Russian Ministry of Economic Development and the Council for Economic Modernisation and Innovate Development under the President of the Russian Federation. Priority directions for innovative development of the Group are determined in accordance with Decree No. 899 of the President of the Russian Federation dated 7 July 7 2011.

The main areas of innovative activities and scientific, R&D and technological projects of Sovcomflot Group are as follows:

- Developing the shipowner's technical specifications for Aframax tankers with dual-fuel main engines;
- Designing vessels capable of operating in the most challenging winter conditions in the North Atlantic for an extended service life of 25 years (equivalent to a 40-year service life of a vessel operating in other parts of the world's ocean).
- Factoring in new shipbuilding regulations into strength calculations and fatigue characteristics of hull structures.
- Conducting research, calculations and experiments to select optimal parameters for ship power plants in terms of energy efficiency and environmental impact reduction, as well as to select optimal hull shapes and parameters for propeller-rudder systems.

Sovcomflot stimulates professional development among its staff and encourages employees to pursue additional education in order to gain in-depth knowledge of modern technologies used in fleet operations. Our engineering staff have high scientific potentials: currently, 17 seafarers, who completed post-graduate studies and received the title of Candidate of Technical Sciences or are preparing to defend their theses, work in the Company's fleet.

1. Hulls 131110 and 131120 were ordered by a VEB-Leasing Group company and are to be subsequently transferred to SCF Group for operation after completion of construction.

At the end of 2018, an operational centre for real-time vessel tracking was opened at the Sovcomflot headquarters in St. Petersburg.

The centre performs the following tasks using artificial intelligence:
- Controlling and analysing navigation safety data.
- Optimising ship routes taking into account hydrodynamics, weather conditions, and business objectives.
- Monitoring the ship's operation in real time (collecting and processing the ship's navigation and technical performance parameters, video feeds from surveillance cameras).
- Voyage planning: selecting electronic maps and guides, preparing a request and ordering maps for a voyage.
- Special Arctic navigation control capabilities: analysis of meteorological and ice conditions and movements of ships, identification of hazardous ice formations and areas with difficult ice conditions, development of recommendations for masters and determination of the safest route in ice conditions.
- Control and analysis of the performance of the ship's systems in terms of energy efficiency, bunker consumption, etc.
- Remote access to the ship's systems, log of faults, etc. for onshore specialists to analyse the technical condition of the ship in case of malfunctions in ship systems and help crews to fix faults.

Key achievements in innovation and R&D

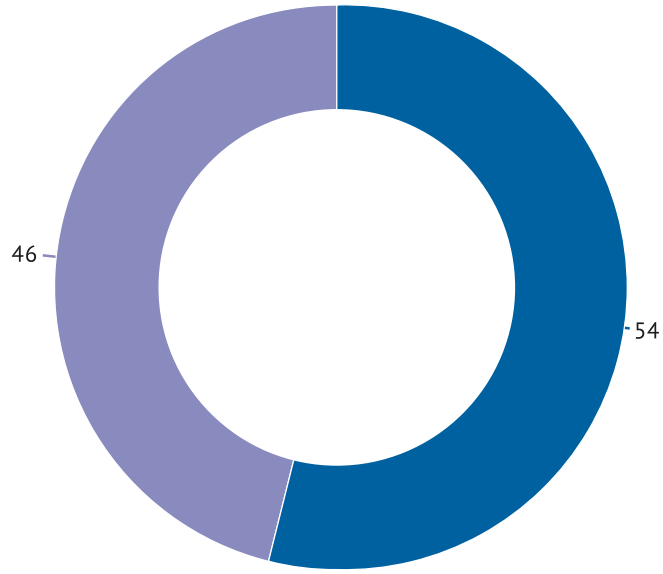
- Sovcomflot won the Environment Award – Individual Company at the Lloyd's List Global Awards 2018. The initiative for using LNG as the primary fuel for large-capacity tankers was highly appreciated by experts. In 2018, Sovcomflot put into operation the world's first Aframax crude oil tankers specially designed to use LNG as the primary fuel[1].
- *Yevgeny Primakov* , a multifunctional icebreaking platform supply vessel put into operation in January 2018[2], was named Support Vessel of the Year by Offshore Support Journal, an international trade publication.
- By the Decree of Russian President Vladimir Putin dated 2 March 2018 a group of seagoing personnel and employees of onshore units of PAO Sovcomflot was honoured with high state awards for major contribution to the implementation of the project for creating the world's first icebreaking LNG tanker, *Christophe de Margerie* . The tanker was specially designed and built to order for Sovcomflot to enable the safe year-round transportation of liquefied gas for the Yamal LNG project. Operations under the project started in December 2017.
- PAO Sovcomflot employees, in collaboration with specialists from the Central Research Institute of Automatics and Hydraulics and Bauman Moscow State Technical University, prepared a research paper on the topic "Development of technological solutions enabling the creation of an autonomous system for safe and reliable navigation in the most challenging zones of the Gulf of Ob". The research was performed as part of the international competition of scientific, scientific-technical and innovative developments aimed at the development and exploration of the Arctic and continental shelf in 2018, conducted with the support of the Government of the Russian Federation. The paper won the first prize at the competition.
- A new edition of a unique training manual, Practical Recommendations by SCF Captains for Vessel Management under Ice Conditions, was prepared in 2018. The author team is comprised of ice captains of Sovcomflot ships that participated in the implementation of industrial Arctic projects. The manual is based on the consolidated and systematised experience gained in working on the Sakhalin-1, Varandey, Prirazlomnoye and Novy Port projects. In the new edition, practical recommendations on the use of Azipod propulsion units to manoeuvre Arctic shuttle tankers were complemented by experience in using them in heavy ice conditions in the Kara Sea and the Gulf of Ob. The updated manual was published and distributed to the SCF fleet and Russian maritime universities and training centres in January 2019.
- 2018 marks ten years since SCF vessels began servicing the Varandey Project. The Company's participation in the project was recognised by the Russian Government award in science and technology "for the development and industrial implementation of innovative scientific, methodological and technological solutions for the establishment of an oil transportation system in the seas of the Arctic Ocean". This involves the construction and operation of a unique series of Vasily Dinkov-class Arctic shuttle tankers. In 2008, the tanker *Vasily Dinkov* was also among the finalists for the prestigious Ship of the Year award from leading shipping publication Lloyd's List.

1. For more detailed information about this series of vessels, see section 3.2.2. of this Report, Implementation of investment projects - Key results, and section 6.4., Environmental protection.
2. For more detailed information about the vessel, see section 3.2.2., Implementation of investment projects - Key results.

Financing of innovative activities

The financing of R&D, engineering activities, professional training, retraining and skill improvement of PAO Sovcomflot personnel in 2018 amounted to USD5.3 million.

Structure of R&D expenses in 2018, %



3.3.2. Assessment of the innovative development performance

The Company regularly monitors and analyses the integral key performance indicator of innovative development.

114,07%

the value of the integral performance indicator of innovative development of PAO Sovcomflot in 2018

The integral key performance indicator of innovative development includes four elements:

- The level of R&D financing expenditure at PAO Sovcomflot. The target is no less than 0.4% of the annual net revenue;
- The level of navigation safety and the Company's compliance with customer requirements - the average number of observations from inspections by OCIMF member companies for all SCF vessels during the reporting period. The target is no higher than the industry average, which is calculated annually based on ship inspection results according to OCIMF and INTERTANKO data;
- The level of operating expenses per vessel, determined as a percentage of industry average (based on data from independent analytical sources). The target is less than 100%.
- The level of vessel crew costs, determined as a percentage of industry average (based on data from independent analytical sources). The target is less than 100%.

3.4. FINANCIAL RESULTS

3.4.1. Key financial indicators

In 2018 the tanker market remained at one of the lowest levels in the past 25 years. However, in 4Q 2018 there appeared some signs of recovery in freight rates in the tanker market due to a slight increase in cargo base and demand for energy shipping. Against this background, measures taken to diversify the fleet with a focus on the development of industrial business, as well as the Group's balanced freight policy, enabled the Group to maintain a stable financial position in the reporting period.

The financial statements of Sovcomflot Group were prepared according to IFRS and disclosed online. Below is a brief overview and analysis of the key financial indicators of the Group.

The book value of vessels in operation decreased by 2% from US$6,291.3 million at the end of 2017 to US$6,165.7 million at the end of the reporting period. Total assets of the Group amounted to US$7,142.2 million as at 31 December 2018. The share capital at the end of 2018 was US$3,350,1 million, down 1.7% from 2017.

US$7,142.2 MILLION

the amount of the SCF Group's assets at the end of 2018

The Group maintains a stable programme of capital investments during all phases of the shipping cycle. Investments in fleet construction[1] in 2018 totalled US$379.3 million (2017: US$556.7 million), with the amount payable under current shipbuilding contracts in 2019-2021 at the end of 2018 being US$690.3 million.

The investment programme and operating activities were financed through secured bank loans (as at 31 December 2018, total debt to banks amounted to US$2,575.5 million thousand), proceeds from the placement of unsecured Eurobonds amounting to US$900 million, and operating cash flow.

Despite the continued volatility in financial markets and the unstable geopolitical and economic situation in the world, the Group retained access to both foreign and Russian debt capital markets.

1. Investments are as reported in the cash flow statement in the consolidated financial statements of PAO Sovcomflot prepared under IFRS, which includes the costs of acquiring vessels during the reporting period and the costs of vessel construction in progress.