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MARKETING INFORMATION AS A BASIS FOR DEVELOPING ANTI-CRISIS INVESTMENT STRATEGIES FOR RENEWING THE FLEET OF RUSSIAN HELICOPTERS

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ABSTRACT

The article shows that for a helicopter manufacturing enterprise, adaptation to the requirements of the external environment is one of the main conditions for achieving success and reducing the risk of not selling the created helicopters. For the best use of its scientific potential with limited financial and material resources and to reduce the risks of production and financial activities, the implementation of anti-crisis investment programs with the maximum possible effect, comprehensive marketing research is needed. Conceptual directions of marketing researches of predictive parameters of operations performed by helicopters are proposed, on the basis of which a helicopter manufacturing enterprise can develop a forecast of changes in the structure and number of the available helicopter fleet in the medium term and propose structural and parametric optimization of the fleet, taking into account new models of helicopters that meet the economic interests of operators to a greater extent and consumers of helicopter services.

Keywords: *Airlines, Anti-Crisis Strategies, Customers Of Work, Marketing Research, Structure And Number Of Helicopter Fleets.*

1. INTRODUCTION

The crisis phenomena occurring in the economy and, as a result, the instability of the socio-economic environment, have led to the emergence of various problems for individual enterprises and entire industries associated with a drop in demand for their products. One of such industry is the aviation one.

Helicopter manufacturing enterprise can develop and accumulate scientific knowledge only in the process of creating new helicopters or their modifications, selling which on the market with a profit for itself and receives new impulses for its development. Without feedback, i.e. information about the state of the external environment and its parameters, the enterprise cannot work normally [1]. A certain difficulty is the study of the structure of the external environment, as well as the mechanism and intensity of its influence on the goals and strategies of the developing enterprise.

In the course of implementing its strategic plans, a helicopter company faces at least two types of financial and economic risks:

1. risk of incorrect forecasting of the helicopter market and receiving incorrect data on the current state of the helicopter market. The main reasons for this risk are the lack of a system for continuous forecasting of the market environment at the helicopter manufacturing enterprise and the inability to carry out market monitoring, including forecasting the development of individual market entities: regions where helicopters are based, airlines, individual industries and customers of helicopter services. To compensate for this type of risk, it is necessary to involve professional marketing consultants in the work and to improve the strategic planning system, which includes a subsystem for the constant collection, systematization and analysis of marketing information;
2. risk of failure to market new created helicopter models. The main reasons for this risk are the lack of complete and reliable information on the market attractiveness of various market segments at the enterprise, obsolescence of the helicopter by the time it appears on the market, replacement of this type of helicopter by a competitor's helicopter, decrease in the effective demand of airlines and customers of helicopter services and reduction of demand in this type of helicopter. To compensate for this

risk, it is necessary to create and constantly update a database on potential helicopter consumers, their activities, intentions, socio-economic situation, use all forms of marketing that allow connecting to new market segments, develop a long-term helicopter production plan and inform potential consumers about it, improving the consumer properties of helicopters.

An assessment of the potential capabilities of a helicopter-building enterprise and its position as a developer of various types of helicopters in the existing market must be constantly compared with the current market situation and the enterprise's own scientific, technical, financial, human and other resources. For the best use of their scientific potential with limited financial and material resources and to reduce the risks of production and financial activities, to implement anti-crisis investment programs with the maximum possible effect, comprehensive marketing research is needed. The result of such studies will be a well-founded formation of a competitive, promising type and fleet of helicopters that meet market requirements and the conquest of a significant market share. The relevance of such studies in the context of globalization of the market economy is constantly increasing.

2. THEORETICAL BASIS

The formation of an anti-crisis strategy for the preservation and development of the Russian helicopter industry requires a special integrated approach and the use of many areas of scientific knowledge, such as marketing, systems analysis, strategic management, forecasting theory, economic geography, regional economics, etc.

For a helicopter-building enterprise, the formulation of the strategic task of anti-crisis management is based on taking into account the external environment and its changes [2]. Based on the system orientation, a helicopter manufacturing enterprise is a complex dynamic and probabilistic system. The external environment for this system is government bodies, the system of aviation industry enterprises, enterprises operating helicopters, enterprises of various sectors of the economy and individual customers of helicopter services.

It is important to study the links between the external environment and the activities of the developing enterprise [3, 4].

For a helicopter manufacturing enterprise as a separate business entity, adaptation to the requirements of the external environment is one of the main conditions for achieving success and reducing the risk of non-implementation of the helicopters being created. This means that the enterprise needs to analyze the influence of objective and subjective (deliberately created by man) environmental factors. Their impact on the strategies developed by the enterprise for creating new helicopters is very different, and therefore requires a different approach to their assessment and possible neutralization. Therefore, in the process of preparing managerial decisions in the development of new helicopters, first of all, it is necessary to conduct a thorough analysis of the operating conditions of future aircraft, assess the compliance of their flight performance with the requirements of customers and their consumer preferences and identify specific assessments of the impact of each parameter of the external environment on individual parties of production activities of the helicopter plant. The study of these parameters of the external environment is the basis for marketing research of a promising type and fleet of helicopters [5].

3. METHODOLOGY

Anti-crisis marketing strategy of a helicopter manufacturing enterprise, even before the development of new types of helicopters, involves a deep analysis of the market situation, determination of its own position in the market or its individual segments, collection, systematization and analysis of marketing information about the factors of the enterprise's market environment and commercial risk [6].

It is proposed to conduct marketing research and analysis of marketing information of the existing helicopter fleet in the following areas:

- structure of the fleet by types and classes of helicopters;
- trends in the replenishment and write-off of the helicopter fleet;
- age structure of the park;
- annual flight hours by type of helicopter;
- scope of performed work.

Obtaining, systematizing and analyzing of this marketing information will reveal the main trends in quantitative and structural changes in the park

and develop a forecast of its state for the future. This will serve as the basis for the development of an anti-crisis investment strategy for renewing the fleet of Russian helicopters.

The entire fleet of Russian civilian helicopters includes helicopters of light, medium and heavy classes (Figure 1). As of 2017, the structure of the fleet consisted of approximately 70% of Russian-made helicopters and 30% of foreign-made helicopters.

The most widespread Russian light-class helicopter is Mi-2. It accounts for 16% of the existing fleet. Of the total number of foreign light helicopters, the most common are Robinson helicopters (52%).

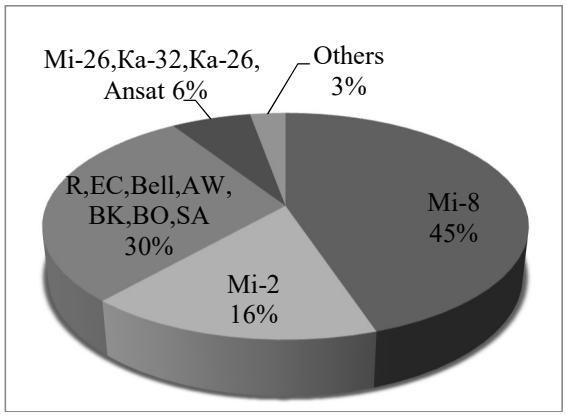

Figure 1: Structure of the helicopter fleet by classes and types of vehicles

The largest share of the Russian helicopter fleet (45%) is Mi-8 middle class helicopters in various modifications. The share of heavy helicopters of Mi-26 type is insignificant (2.5%). The total number of the helicopter fleet continues to grow (Table 1).

Table 1: Number of Russian civilian helicopter fleet.

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number of the park, pcs (according to the register)	1929	1939	1983	2223	2248	2476	2605	2644	2632

From the data given in the Table 1 we can see that in the period under study there is an increase in the Russian fleet of helicopters, but it is replenished due to an insignificant number of “late” series of Mi-8 helicopter and, to a greater extent, due to foreign-made light helicopters [7, 8].

The structure of the park for the period 2009-2017 has undergone significant changes. There is a pronounced tendency towards a decrease in the number of Russian helicopters Mi-2, Ka-26, Mi-8 of "early" series and Ka-32. These data are shown in the Figure 2.

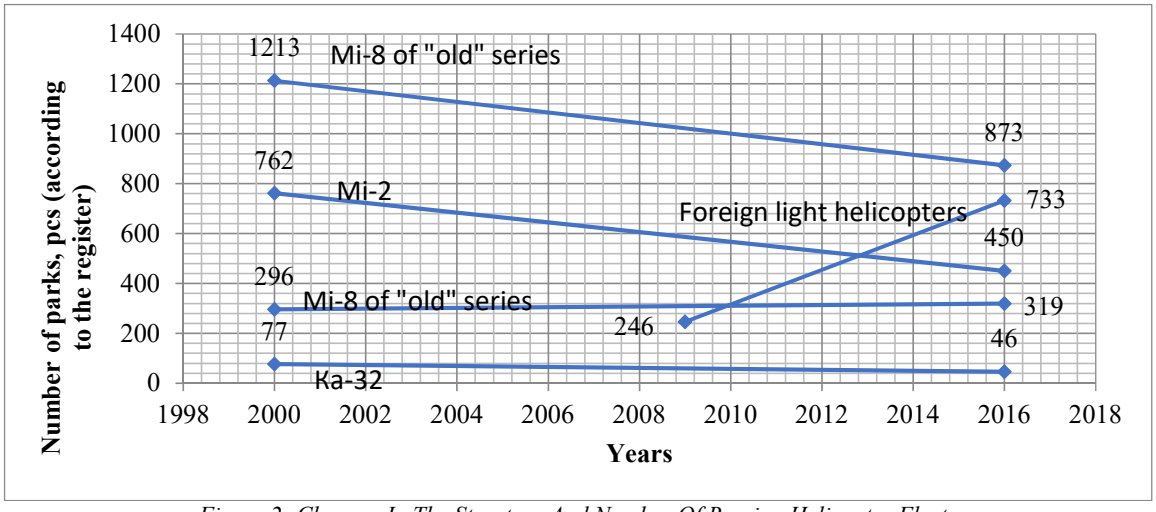

Figure 2: Changes In The Structure And Number Of Russian Helicopter Fleets

It should be noted that 32% of Mi-8 helicopters are of the "early" series, the average age of which is 32 years, and the maximum age is 43 years. Other types of helicopters have an average age: Mi-2: 31 years old (maximum 39 years old), Mi-26: 24 years old (maximum 31 years old), Ka-32: 27 years old (maximum 35 years old). The age of 87% of the fleet of Russian helicopters has passed for 25 years.

From 1994 to 2016, the volume of commercial use of the Russian helicopter fleet decreased by about four times due to a decrease in the number of customers for helicopter operations and a decrease in their solvency. These data are shown in the Table 2 [8].

Table 2: Scope Of Commercial Use Of The Russian Helicopter Fleet.

Years	1982	1986	1990	1994	1998	2002	2006	2010	2014	2016
Physical plaque, thousand hours	1740	1770	1750	460	325	385	420	415	400	350

As we can see from the Table 2 data, in recent years the volume of use of Russian helicopters has practically not increased. In the coming years, we should not expect a significant increase in the volume of commercial use of helicopters. Most likely, the demand for them will be determined by traditional consumers, for whom helicopters will remain the only possible means of transport for their production processes.

The current situation with the state of the helicopter fleet and its use poses a number of problems for airlines, and their future financial and economic condition depends on the possibility of their successful solution. Currently, the problem of renewing the aircraft fleet is becoming the first one.

4. RESULTS

Factors that have a primary impact on the implementation of the strategy for updating fixed assets in the airline include the following:

- physical and moral aging of the helicopter fleet;
- annual flight hours for one helicopter;
- prices for new models of helicopters and cost of their operation.

Helicopter, like any type of equipment, is subject to physical and mental wear and tear. Physical wear and tear determines the degree of suitability of the helicopter for operation. The airline can overhaul an existing helicopter or purchase a new helicopter. The airlines continue to operate the helicopters purchased many years ago, periodically overhauling them or extending their resources. This became possible due to the initially high technical and operational qualities of helicopters and the significant development potential incorporated in their design at the design stage.

The mental wear and tear of the helicopter suggests that its further use becomes economically unprofitable, although it is serviceable. The issue is resolved in favor of a new helicopter model if it has greater performance or other attractive consumer properties and is more economical than the old one. It means that the consumer properties of the new helicopter model will not be excessive and the cost of work on the new helicopter will be less than on the old one, providing it with competitive advantages over a similar-purpose helicopter that has been in operation for a long time. Considering these two aspects in a complex, we can conclude that it is advisable to renew the helicopter fleet in terms of its mental and physical aging.

The helicopters purchased by the airline for fleet renewal must be provided with a high load, that is, with a high annual flight time. In 2016, the average annual flight time for the fleet of Mi-8T helicopters was 455 hours, and for Mi-8MTV helicopters, it was 369 hours. The more helicopters are used, the less the need to purchase new equipment.

The low level of demand for helicopters among customers of helicopter operations can largely be explained by the significantly increased cost of a flight hour, which tends to significantly increase. For example, the price of a flight hour for Mi-8T helicopter is 120 000 rubles, for Mi-8MTV helicopter (up to 25 years old) it is 215 000 rubles, and for new Mi-8MTV helicopter it is 320 000 rubles. In the event of an increase in the cost of a flight hour, transportation customers begin to look for other possibilities for solving their transport problems by investing financial resources in the construction of roads and airfields capable of receiving cargo aircraft.

Stimulation of demand for new helicopters can be ensured through the maximum possible adaptation of the development and production of new helicopters to the requirements of various

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market segments [9]. To solve this problem, it is necessary to conduct marketing research of helicopter operations currently being performed and to predict their possible parameters and characteristics for the medium term. Such studies will make it possible to thoroughly analyze the market as a set of consumers, designate target segments and then classify the selected segments according to various characteristics.

Helicopter manufacturing enterprise as a subject of market relations must have permanent and stable ties with airlines operating helicopters. These connections are necessary for the enterprise to understand the development trends of the regions in which helicopters are operated and, on this basis, to adjust the strategic goals of its activities. They can consist in creating modifications of existing ones or shaping the appearance of new helicopters and identifying the most favorable and promising areas of their application.

As a result of marketing research, predictive information should be collected on the socio-economic development of individual regions, involvement of natural resources in economic circulation, territorial development of production, composition of products, production volumes and its dynamics for individual enterprises [10]. Based on these data, predictive models can be developed for assessing the impact of indicators of socio-economic development of regions on the volume of the airline's flight operations in the future. The functionality of such a model can be as follows:

$$Q_i = \mathrm{F}(K_i, V_i, P_i, R_i), \quad (1)$$

where: Q_i is the amount of flight work of the airline in the i-th region, hour;

K_i is the volume of investments in the i-th region, million rubles;

V_i is the volume of industrial products in the i-th region, million rubles;

P_i is the volume of contract work in the i-th region, million rubles;

R_i is the volume of retail trade in the i-th region, million rubles.

Based on this forecast, it will be possible to determine the structure of flight operations with varying degrees of segmentation by type of work, characteristics, parameters and conditions of work performance. On the basis of such forecasts, it is possible to determine the required type of helicopters and the areas of their preferred application and specialization. The Figure 3 shows the conceptual directions of marketing research of the forecast parameters of the work performed by helicopters.

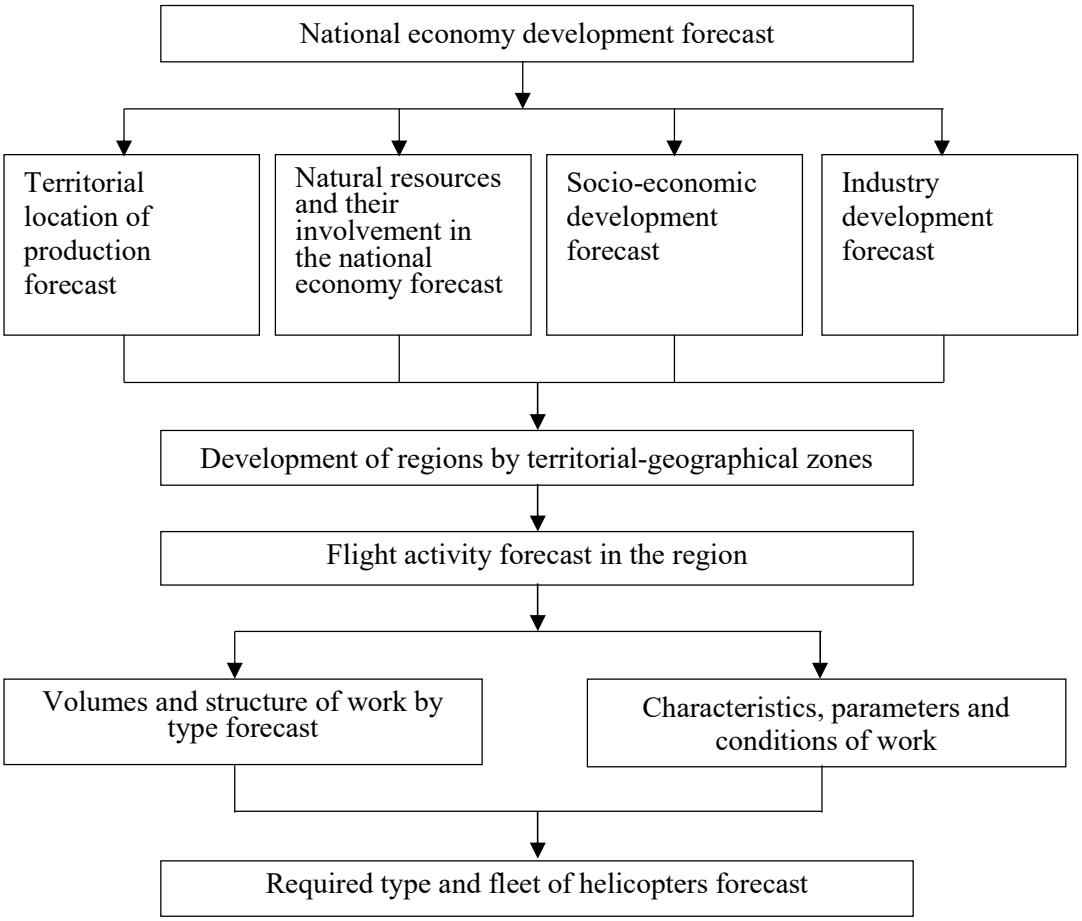

Figure 3: Areas Of Marketing Research Of The Forecast Parameters Of The Work Performed By Helicopters

When comparing the forecasts of the existing and future fleet, it will be possible to draw a conclusion about the possible type of new helicopters and their required number.

If we consider the distribution of the existing helicopter fleet by territorial and geographical zones, we can say that approximately 70% of the entire fleet is concentrated in the North, Siberia and the Far East, i.e. in industrially underdeveloped and climatically harsh regions. The main resources of these regions are oil, gas, minerals and timber. The main goal of the development of these regions is the creation and further development of the fuel and energy complex. It presupposes the joint functioning of many industries: geology, geodesy and cartography, construction, communications, medicine, etc. When these territories are underdeveloped in transport, helicopters are the primary means of transport. These regions remain the most promising target markets for the use of helicopters. It should be noted that the development of specific industries can have strong differences from the general economic trends in the development of the entire country. Therefore, it is necessary to constantly keep in sight the investment processes occurring in the industries that supply raw materials and in the industries that consume finished products and their infrastructure [11]. Further research assumes the use of a certain system of segmentation of the helicopter operations market for individual regions, with the help of which it is possible to establish the general consumer characteristics of helicopter customers and the main requirements that they impose on them.

Regions differ in their sectoral structure, economies, trends and rates of development. Accordingly, volumes, types and conditions of work performed by helicopters differ in many respects.

In the conditions of market relations, emergence of competition, "complexity" of the environment and uncertainty of the behavior of customers of helicopters increases sharply and the system's

capabilities for planning and organizing interaction with the environment become more complicated and limited. This is especially important to consider for a non-stationary environment (prone to crises, sanctions, economically unstable), the behavior of which changes over time. This refers to the sectoral structure of the region's economy and its place in the all-Russian trends in the development of the national economy as a whole [4].

For a helicopter company, the segment structure of helicopter customers and their market significance at the level of the regional economic zone is of great interest [12]. Such marketing information is necessary for developers to better meet the needs of customers and to reduce the cost of their products, to develop the social infrastructure of the region and to more efficiently use helicopters in airlines. Departmental affiliation of customers, which makes it possible to assess their "weight" in the present and prospects for the future, is very interesting. This is important because only the leading industries of the regions, their financing, maintenance at a high competitive level, renewal and formation of their own infrastructure determine the development of the entire region and development of other areas of economic activity: healthcare, housing construction, law enforcement, etc.

The systematization and analysis of the obtained retrospective data on the existing Russian helicopter fleet and forecasts of the socio-economic development of the regions will enable the helicopter manufacturing enterprise to develop a forecast of changes in the structure and size of the available helicopter fleet in the medium term and to propose structural and parametric optimization of the fleet, taking into account new helicopter models that meet a greater degree to the economic interests of operators and consumers of helicopter services [13, 14].

5. DISCUSSION

One of the conditions for the airline to acquire new models of helicopters is their compliance with the needs of customers of helicopter operations in terms of their flight technical and economic characteristics and the conditions of the work performed. Most often, helicopter customers are not satisfied with three parameters: flight range, helicopter carrying capacity and flight hour price. It is very often impossible to achieve a complete match between the preferences of customers and the capabilities of the airline, and it will become possible to a greater extent with the practical implementation of the proposed marketing research. Based on the results of these studies and their analysis, the level of conformity of the parameters can be established using the conformity ratio Y_C^P, which is calculated by the following formula:

$$Y_C^P = \sum_{i=1}^{n} Q_{P_i} * a_{i\text{cp}}, \quad (2)$$

where: n is the number of types of work for which this type of helicopter is used;

Q_{P_i} is the proportion of positive assessments (conformity) of the parameter of a given helicopter type to the i-th type of work;

$a_{i\text{cp}}$ is the average percentage of use of this type of helicopter in the i-th type of work.

Coefficient $a_{i\text{cp}}$ is calculated as the arithmetic average of the percentage of use of a given type of helicopter for a given type of work for the studied region or group of regions. Due to the importance of such assessments, this problem requires a more detailed study of each of the types of work, methods and conditions for their implementation, flight parameters, etc. This applies to the most significant types of work: transportation of goods, passengers, air patrolling and sanitary transportation. They account for up to 90% of the total volume of work performed by helicopters.

The low solvency of most airlines does not facilitate the sale of more expensive helicopters to operation.

При дефиците средств, как у разрабатывающего предприятия так и в эксплуатационных подразделениях гражданской авиации – в авиакомпаниях, речь может идти не о системе новых вертолетов, а о возможности создать и, соответственно, затем приобретать хотя бы один тип вертолета, для которого будут свои привлекательные сегменты рынка со своими видами, характеристиками и объемами работ.

It should be noted that the buyer of helicopters is more interested not in the price of the helicopter, but in the subsequent operating costs (“consumption price”) for the entire service life of the helicopter. Practice shows that these costs are several times higher than the selling price. So, for example, for a long-haul aircraft, the share of price in the total operating costs for the entire service life is ~ 11%. Therefore, for the developer, minimizing this value is one of the main criteria when

evaluating the effectiveness of a new helicopter. Often, when selling, this "consumption price" indicator becomes decisive, although the price of a helicopter may not be high. A price reduction does not lead to an increase in competitiveness if the ratio of the sale price/consumption price lies in the range of 0.05-0.2. Further research in this direction may show that the structure of the helicopter fleet in various economic regions may change significantly towards the predominance of lighter helicopters.

One of the ways out of the crisis and renewal of the helicopter fleet could be Russian production of much cheaper (almost twice), but similar in functionality, so-called intermediate class helicopters with high anti-crisis potential. These helicopters, in terms of their takeoff weight, are located between light (Mi-2) and medium (Mi-8) helicopters and have a maximum takeoff weight in the range of 5-7 tons. An example of foreign helicopters of this class is Bell-212, Bell-214, AW-139 and S-76 helicopters. In the world helicopter fleet of helicopters of this intermediate class there are already more than 4500 pieces. There is a high and steadily growing demand in the world for these helicopters, which in the future may reach 150 pieces per year.

Trade-in program containing proposals for replacing Mi-2 and Mi-8T helicopters of the "early" series with the newer Mi-8AMT / MTV-1 and Ansat models is under consideration and, in addition to adopting the conceptual general principles of formation, the use of the mechanism leasing, still requires detailed study.

Prospective planning, supported by expertly collected and processed marketing information about market needs, can become the basis for developing an anti-crisis investment strategy and an effective factor in the development of a helicopter company, increasing its competitiveness and a prerequisite for a successful renewal of the helicopter fleet.

6. CONCLUSION

The formation of anti-crisis strategy for the preservation and development of Russian helicopter industry requires a special integrated approach and use of many areas of scientific knowledge, such as marketing, systems analysis, strategic management, forecasting theory, economic geography, regional economics, etc.

The anti-crisis strategy of a helicopter company necessitates thorough marketing research. Information on the state of the target helicopter market should include: number and structure of the existing helicopter fleet by type, region of operation, airline, technical condition of the fleet, as well as degree of satisfaction of the main consumers (customers) of helicopter services with the available types and fleet of helicopters. Forecast information should be collected on the development of the national economy as a whole, individual regions and industries, involvement of natural resources in economic circulation, social development of regions, territorial development of production, composition of products, volume of production and its dynamics for individual enterprises. The conclusions obtained from the results of the analysis and assessment of the existing and predicted situation will make it possible to move on to the marketing formation of the system of goals and objectives of the developing helicopter company related to the creation of new types of helicopters. Conceptual directions of marketing researches of predictive parameters of operations performed by helicopters are proposed, on the basis of which a helicopter manufacturing enterprise can develop a forecast of changes in the structure and number of the available helicopter fleet in the medium term and propose structural and parametric optimization of the fleet, taking into account new models of helicopters that meet the economic interests of operators to a greater extent and consumers of helicopter services.

In recent years, the share of Russian-made helicopters in the Russian helicopter fleet has decreased and, accordingly, the share of foreign-made helicopter fleet has increased also. There is a noticeable aging of the helicopter fleet. There is a real need to update the type and fleet of Russian produced helicopters and bring their characteristics in line with market requirements.

The low level of demand for helicopters among customers of helicopter operations can largely be explained by the significantly increased cost of new modifications of helicopters and their components and, accordingly, higher cost of a flight hour, which tend to grow significantly.

One of the ways to renew the helicopter fleet may be the development and implementation of an anti-crisis program for the production of much cheaper, but rather efficient in terms of their functionality, helicopters of the intermediate class with high competitive potential. Operation of these

helicopters would reduce the cost of aviation work, increase the number of helicopter customers and the volume of work performed. The accumulated profit could be used to purchase new helicopters.

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