

Business vertical integration in Ukraine: motivation, advantages and disadvantages

N. Chukhray

Lviv Polytechnic National University

Received June 21.2013; accepted August 10.2013

Abstract. The paper deals with the problems of increasing the competitiveness of Ukrainian enterprises and integration process in Ukraine. Correlation between a level of business vertical integration and development of a country is well-proven. Basic problems of the integration strategy of Ukrainian enterprises are identified. The author gives us the examples of successful development of the largest private vertically integrated energy company in Ukraine. One of the main directions of developing of the Ukrainian economy is to cooperate with the strategic partners as an important priority in the formation of vertical integrated structures of national importance

Key words: vertical integration, transition economy, the post-Soviet space, the defence-industrial complex (DIC), strategic partners, vertical integrated structures .

INTRODUCTION

Vertical integration has a significant impact on the effectiveness of enterprise activity and competition at the market. As a process, aimed at establishing an exclusive type of relationship between the manufacturer and its supplier, vertical integration, on the one hand, provides a number of advantages for the enterprise against the competitors, on the other - can have negative consequences for economic competition.

Modern world trends and processes, the character and rapidness of which change the future of the world, determine the economic and political place of different countries, and Ukraine being one of them. Nowadays the world financial crisis triggered acute crisis in Ukraine which has been caused besides external factors by serious internal reasons. These reasons reach far beyond financial problems and concern economic recession in national production, inflation, increase of unemploy-

ment, decrease in paying capacity and decline in living standards of the majority of population, bankruptcy of industrial enterprises.

Problems of internal and external markets in conditions of building the innovative economic model, increasing openness of economy as well as issues of connections of globalization processes with internal economic activity of the countries with transition economy are widely discussed in modern economic literature. As A. S. Filipenko points out, globalization of economic development is characterized by increasing interdependence of economies of different countries, greater integrity and unity of the world economy, having at its basis openness of national markets, international divisibility of labour and cooperation [6].

Countries with transition economy in general, and Ukraine in particular, started their movement towards a market economy with a heavy burden of vertical and horizontal dominance. Deep vertical integration of the economy in the post-Soviet space, which is typical for Ukraine, is manifested through internal and external dependency of many industrial enterprises on partners from the former Soviet Union.

Prior to liberalization and privatization processes in countries such as Ukraine, the industrial structure has not experienced significant changes. Thus, Ukraine began market reforms having serious structural problems in the manufacturing sector. In recent years we have seen the tendency of vertical integration development of the Ukrainian economy, especially in export-oriented branches. New vertical unions in industries and motives that induce this process should be considered and studied with special attention.

1. PECULIARITIES OF VERTICAL INTEGRATION IN THE SOVIET UNION AND ITS NEGATIVE IMPACT ON THE ECONOMY OF INDEPENDENT UKRAINE

One of the particular features of the national economy is the deep integration of Ukraine's economy to the post-Soviet economic space (especially to Russia). Industrial- economic cooperation of the post-socialist countries has existed since Soviet times. The collapse of the Soviet Union led to the rupture of a significant relations, which according to the bank's economic development, has led to a 2-fold decline of the industry in general, and 4-fold – of the Engineering [1]. The subjective factors that have a significant impact on the economic relations formation of machinery companies and cause the necessity of its restructuring are:

- relatively high degree of monopolization of engineering production and contiguous areas;
- concentration of engineering production, historically developed in Ukraine, in large industrial enterprises;
- obvious specialization of individual machine-building enterprises, which do not always meet the requirements of the market;
- the need to increase the investment attractiveness of engineering production;
- the ratio between state and private property in the machine-building complex;
- existing competition conditions in the domestic and foreign markets of engineering products.

We should note that in the transition to a market economy, the internal and external environment of engineering company is in a constant interrelation, as the market is a source of flow processes formation (resources buying) as well as the ultimate goal of their movement.

Despite the obtaining of Ukraine independence in 1991 and breaking cooperative relations between enterprises, economy integration continues to exist. The economic integration within the post-Soviet countries was supported by the presence of joint production technology, not global competitiveness of many industrial products, an acute shortage of currency, the need to maintain traditional markets and the implementation of a uniform policy on the world market.

The Ukraine drop out from a single economic space with Russia objectively led to the transition to world prices in natural gas trade and other energy resources exported from Russia, which led to a sharp decline in profitability and competitiveness of Ukrainian metallurgical, chemical, engineering and food products [10]. It is estimated that most of the chemical and metallurgical enterprises, agriculture and engineering complexes strongly feel the financial crisis, more than a million people are fired from work. There was a

significant part of the discontinuation of high-tech products as a result of the destruction of cooperative ties in aviation, rocket and space, shipbuilding, instrument and other areas of high technology industries. This led to a halt of most promising Ukrainian machine-building enterprises, the half value of the finished product are Russian components, main market of which is in Russia as a result of closure of the relevant segments of the Russian market and breaking cooperative relations with Russian companies.

Particularly dependent on foreign partners and suppliers is the defence-industrial complex (DIC), which products are competitive on the world market. However, structural and organizational shortcomings of the defense-industrial complex is the root cause costly nature of defense industries, high levels of debt, not loading many of businesses and organizations, poor quality of products etc.

Ukraine inherited after the collapse of the Soviet Union nearly a third of industries which produce defense products. The basis of the defense industry in Soviet times were 205 industrial associations and enterprises, 139 research and design organizations. At that time, Ukraine produced 17% of all Soviet Union defense products [16]. The leading industries in DIC were rocket and space equipment, shipbuilding, transport aircraft, engineering machinery, special radio systems. DIC of Ukraine was largely integrated into union structures and became dependent on foreign orders and supply of components and raw materials [14].

Changes in geopolitical conditions after the collapse of the USSR and the development of Ukraine as an independent and sovereign state demanded a radical restructuring of the defence industry. In its basis, as we know, there was the conversion of military production, which was filed as part of the restructuring of the entire economy. At the state level, 22 civilian programs were developed, which included over 550 subprograms concerning organization of development and production of consumer goods.

To finance the conversion programs, which were planned to be performed mainly during 1993-1996, it was supposed to allocate 600 billion rubles (in prices of 1993). Due to execution of conversion programs there were about 2 thousand new manufacturing processes, over 1000 of new designs of civilian products (from the trolley busses to the equipment for the sugar industry) and more than 3 thousand of new types of consumer goods (from mini-tractors to VCRs) [12].

However, in general reorientation of military production to civilian output destination for complying with state targeted programs did not produce the expected positive results. In fact, it was received no more than 20-30% from planned and they were used by many companies to maintain existing production facilities and salaries. Nearly half of the funds from the financing fund conversion were received by the

enterprises that had no relation to the defence industry. Due to lack of funding (for example, in 1994 for a program of conversion about half of the planned funds were provided) production capacity of defence companies were used for 5-80% of their design capacity [11].

Reduction of military orders, the braking of closed production cycles and other problems required the restructuring and conversion of the defence industry in Ukraine. But there was not a significant restructuring in the Ukrainian defence industry, as well as positive results were not received. Currently, much of the defence industry enterprises and organizations had the period of auctioning, first state-owned holding companies, financial and industrial groups, international financial and industrial groups, leasing companies, consortiums. However, the results of the production of these structures show that most of them have not yet reached the main goal - to ensure profitable production. Main reasons are related to lack of funds to upgrade or enterprise modernization, working capital, debt elimination to state, the lack of an effective legal framework etc.

About 45% of the total number of defence enterprises changed ownership, including: 17% of aircraft, 25% - defence industries, 58% - shipbuilding, and 79% - electronics industry. However, a substantial increase in the efficiency of these enterprises is not observed, since there are a number of problems that can be grouped into two groups: the problems of external and internal nature. Thus, the location of military orders for some of them is restricted by law and is a deterrent to the development of DIC. Production base of defence enterprises require significant upgrades. Physical depreciation of fixed assets is over 70%. Accordingly, most firms have low profitability. Insufficient financial and economic situation of enterprises has led to the emergence of wage debts to employees.

In the first stage of privatization: the focus was on individual highly profitable enterprises and their subdivisions. Consequently, the preconditions for the separation of common industrial and technological systems into separate structures were created, many of which cannot establish its own production and their own survival in the current economic conditions. It is obvious that the policy of downsizing and disintegration has not justified, because the privatization process has not always been closely associated with the policy of restructuring. Research shows that many companies support the idea of the creation of financial-industrial groups, holding companies and large corporations. In this regard, the privatization process needs further improvement and development of organizational and structural forms of business.

Despite the negative effects, which are typical to the Ukrainian economy at present, there are such branches in Ukraine, the products of which meet international standards. Ukraine is known to be one of the seven leading countries in the world in the branch of nuclear and space investigations, nuclear energy, development of aerospace technologies, production of some medicine,

biotechnology, etc. (see Table 3). For example, in the space industry booster "Zenith", which was developed by the SDB "Pivdenne" and was made by the "Pivdenmash" in cooperation with the Russian Federation, is the basis of international projects "Sea Start" and "Global Star". According to experts, today it is one of the best missiles in its class. The great interest of foreign firms is kept to developed in SDB "Pivdenne" rocket "Cyclone", which is designed to launch satellites of middle class [15].

Ukraine has a modern shipbuilding industry, which in the former Soviet Union accounted 30% of total shipbuilding by tonnage and 40% - the number of ships [20]. Its products include various types of ships: from small patrol boats and hydrofoils to large cruisers, aircraft carriers. Industry has broad opportunities for repair and modernization of surface ships and submarines.

Aviation industry is a leader in the development of transport and military transport aircraft. Significant scientific, technical and industrial potential has jet engine, which is capable of producing a wide range of engines for aircraft and helicopters. Engines of Zaporizhske, "Motor Sich" are used on airplanes in almost 60 countries [20]. Enterprises of aviation engine building have ample opportunities of international cooperation, particularly in providing services for capital and maintenance of engines for helicopters of types "Mi" and "Ka".

Tank branch reached the world level. Tanks T-80UD and its modern modification of the T-84, which are produced at plant, named by Malyshev (Ukraine) successfully compete in the global market. Compared to the aircraft and shipbuilding industries armours industry is much less dependent on imports of raw materials, components. It is able to produce many products virtually in closed cycle.

Ukraine is the world leader in the manufacture of navigational instruments, heads for homing missiles "ground-to-air", stations of Radio control, sound-metrical systems of artillery intelligence, complex control systems, radio communication equipment, radio and electronic warfare aircraft and missile systems. Ukraine has kept a well-developed electro-optical industry. In the former Soviet Union it was a leader in the production of universal radar [16].

Although the share of trade Ukrainian defence-industrial complex (the DIC) with the European countries never exceeded 2.5% in total defence exports, many Ukrainian defence enterprises are now able to actively search for cooperative ties with famous foreign companies. After all, before the emergence of the domestic market, these companies could take over the role of intermediaries in advancing the global markets of certain firms, being, of course, sub-contractors and integrators in rearmament [14]. Finally, access to third country markets with European partners already looks very attractive alternative to one-sided and, as demonstrated by last half century, the adverse orientation solely on Russia.

Table 1. Classification of Ukrainian Production According to the Level of Competitive Capacity

№	Basic Branches and Their Production	Level of Competitive Capacity
1.	1. Design and production of space craft, carrier rockets, craft and other airborne vehicles. 2. Design and production of nuclear station turbines. 3. Generating heat and electrical energy using thermonuclear reaction.	1. World level of competitive capacity according to the functional characteristics. 2. World level in providing orders for foreign countries. 3. World level.
2.	1. Production of definite kinds of weapon for armoured units and other forces. 2. Production of some kinds of metal-working machines, measuring devices, etc. 3. Production of diesel locomotives, ships.	1. European level of competition.
3.	1. Production of mechanical engineering devices for mining, metallurgical, coal and other industries. 2. Mechanical engineering, engineering of various devices (suitable for many kinds of production).	1. CIS level.
4.	1. Production of main types of consumer products (groceries, footwear, clothes, building materials, furniture, printing production etc.)	1. Competitive capacity in the internal market.

Source: *Strategic Challenges of the XXI century society and economy in Ukraine / Ed. Acad. National Academy of Sciences of Ukraine VM Geysa, Acad. National Academy of Sciences of Ukraine VP Semynozhenko, Corr. NAS of Ukraine Boris Kvasniuk. Volume 2: Innovation and technological development of economy. - K.: Phoenix, 2007. - 156.*

2. ADVANTAGES OF INTERNAL VERTICAL STRUCTURES IN UKRAINE TODAY: SUCCESSFUL EXAMPLES

The results of empirical research of 10 000 of Ukrainian enterprises activity conducted by the Antimonopoly Committee of Ukraine in 1996-1998 showed that the increase in vertical integration at the end of the 90's was caused by severe restrictions of liquidity constraints during the crisis of non-payments [1]. Increasing of vertical linkages helped firms with a relatively low initial vertical integration to overcome the de-organization in the mid 90's. At the same time, firms with a relatively high initial level of vertical integration showed less flexibility in organization to the changing market environment, resulting in lower efficiency.

Vertical integration gained special development in Ukraine through cross-shareholdings. One indicator of this phenomenon is the emergence of new large companies with vertically related business areas. Currently, these companies hold about 25 percent of positions in the ranking of the top 100 with respect to income and exports [2]. These intermediary companies usually sell products of the firms in which they maintain the structure of cross-shareholdings. Widespread of cross-shareholdings in Ukraine is related to a low level of protection of shareholders who have minority shareholdings, underdeveloped financial system, which limits the possibility of complete redemption; opportunity for evasion and tax avoidance, which are provided by this type of business organization.

Among the new vertical associations in Ukraine, successful experience which requires a more thorough study is Donbas Fuel-Energy Company (DFEC) . It is the largest private vertically integrated energy company in Ukraine. DFEC enterprises form a production chain from coal mining and enrichment to the generation and supply of electricity. Schematically, the vertically

integrated model of corporation "DFEC" development is depicted in Figure 1.

The company was established to improve the efficiency of the energy business, and create transparent asset management system. Today the company fully satisfies the generating assets of domestic coal. Vertical integration of DFEC, along with favourable geographical location of assets allows the company to guarantee the quality and reliability of the entire production chain, and successfully manage the efficiency and control the entire value chain. The advantage of vertical integration business is the ability to reduce the business risk of branch units of the Company.

Transfer to the vertical integration model began in 2005, when on the basis of the association DFEC the Corporation managing company "DFEC" was formed. Over time, a Corporate Centre Ltd. ("DTEK"), which is responsible for the financial and operational results. All enterprises of DFEC the unified management processes were introduced, allowing to establish effective working between all departments of enterprises [20].

As a result of the equipment modernization and relaying protection of Burshtyn TPP, which is included in DFEC, and thanks to the signing of agreements on fail booking of coordinated export with system operators of Continental Europe regional group adjacent grids, the company sells to overseas markets in Europe electricity, namely in Romania, Belarus, Moldova, Slovakia, Poland. DFEC based on government decisions buys electricity on the wholesale market for future exports, at a wholesale market price. In January-September 2012 DFEC doubled electricity exports over the same period last year - to 7.126 million kW / h [16]. Also uninterrupted supply of electricity to Belarus during the period, and an increase in the supply of electricity to the EU, including the beginning of deliveries to Poland (restored in October 2011) provided export growth.

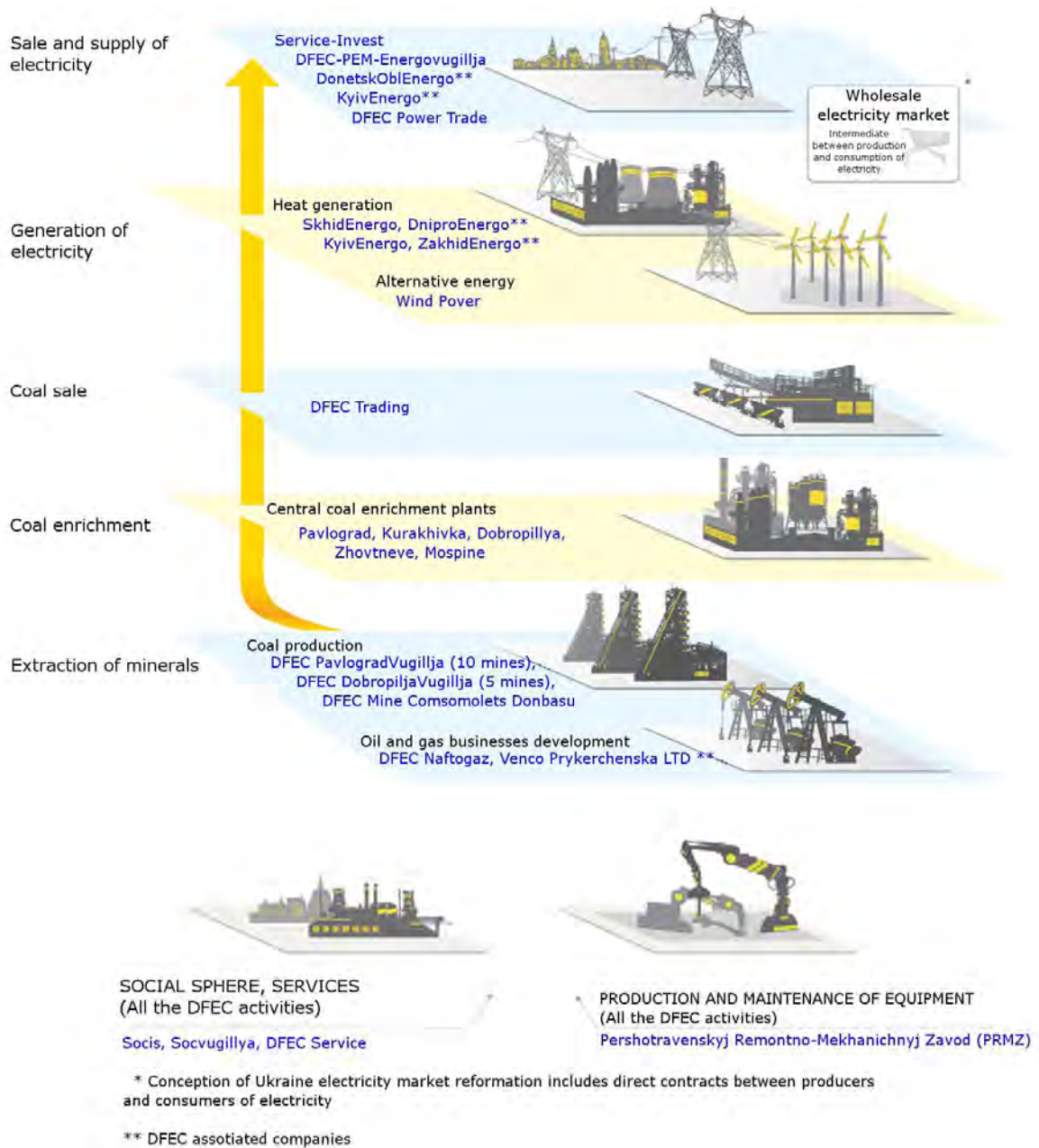


Fig. 1. The vertically integrated model of corporation " DFEC"
 Source: *Official site of Donbas Fuel-Energy Company (DFEC) // <http://www.dtek.com>*

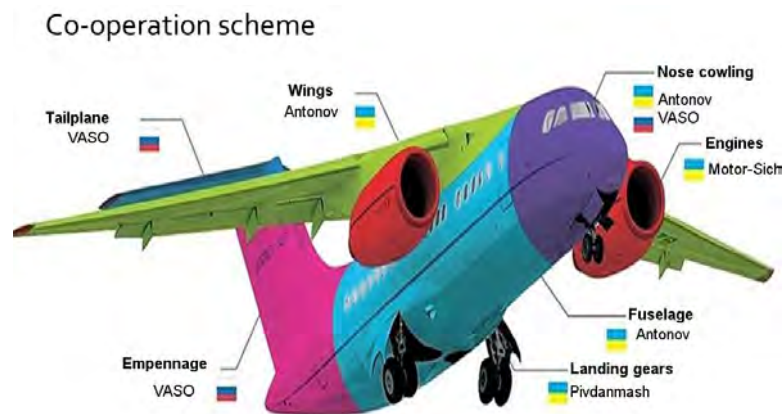


Fig. 2. Cooperation of aircrafts An-148
 Source: *<http://uk.wikipedia.org/wiki/>*

This rapid growth was made possible by comparatively low price of electricity supplied to the European market. The export of electricity is important primarily for the development of the coal industry, and export growth is provided primarily by power plants that run on coal.

Thus, not only the share increases of the European market for electricity, but also related industries of electricity generation- coal mine is ensured. Export means extra load of thermal generation, which means that the collier will be able to market their products. At the same time, some state-owned coal enterprises stop, and their employees do not get paid because of problems with the sale of coal.

Thus, the private owner and the effective management of the holding enabled to use all the benefits of the implementation in practice of vertical integration model of development in such strategic area as energy.

3. STRATEGIC PARTNERS AS AN IMPORTANT PRIORITY IN THE FORMATION OF VERTICAL INTEGRATED STRUCTURES OF NATIONAL IMPORTANCE

Often, the success in the world market does not only need technical characteristics and service guarantees. And the point is not only in the formal computation and comparison of tactical and technical characteristics of the goods or consumption prices. An important key success factor may be the choice of strategic partner and a good way to cooperate with him for the division of interests in future orders. Such arguments often become a priority in the market of industrial products, especially in knowledge-intensive field such as the aerospace industry.

Let's consider the example of AN-148, a developer and manufacturer of which is the Ukrainian State Enterprise "Antonov". This passenger jet, designed for passenger transport on regional and short-haul flights. State Enterprise "Antonov" (formerly Aviation Scientific-Technical Complex named by Oleg K. Antonov, or ASTC named by O.K. Antonov) - a skilled team, design office complex of laboratories, pilot plant and Test Complex that allow to solve a variety of problems on development and aircraft certification, interact with manufacturers of all types of aircraft "Antonov".

In the implementation of the An-148 in the preparation and production of aircraft companies from 15 countries participate [3]. Serial AN-148's are built in Kiev, at Serial factory "Antonov" and in Russia, Voronezh. Cooperation of aircrafts An-148 includes attracting of many businesses, most of them located in Ukraine and Russia (see Figure 2).

Such deep vertical integration in the production and preparation of the aircraft, which has historically evolved since the Soviet Union at this stage often becomes a barrier of program development. The work

on creating its own closed loop production aircraft of this series develops in Ukraine.

Approximate capacity of the world jets market for the period until 2013 - about 500 pieces, CIS - 170 planes. Direct competitors are planes Sukhoi Superjet 100, Embraer 190 and ARJ21-700. At the air show "Max" 2007 SCC "Russia" has signed a contract to supply 6 aircraft, with an option for another 6. In 2009 "AeroSvit" agreed with Oleg Antonov ASTC to buy or lease supplies for three years a 10-AN-148 and its modifications, the An-158 [13, 22, 23].

Ukrainian An-148 aircraft is high-competitive: it has good performance characteristics, favourable price and an adequate level of service and reliability. It can count on a significant portion of the potential market of CIS countries with 750 old aircraft which should be replaced. As we learned in August 17, 2009 Office of the President of the Russian Federation opted for AN-148, refusing to purchase Sukhoi Superjet 100 for top officials of the Russian state [19]. The decision is made on the grounds of safety. December 30, 2009 State enterprise Kyiv Aviation Plant "Aviant" and now "Serial factory" Antonov "(Kyiv) rolled out of the hangar first production model of regional jet aircraft An-148-100V. Implementation and transfer of aircraft belongs to State Enterprise" Leasingtechtrans. "First contest of leasing aircraft won three SE Antonov [23].

Already in July, 10 2012 in the framework of international aerospace salon Farnborough 2012 Russian leasing company Ilyushin Finance Co. (IFC JSC) signed a sales contract for the supply to 2014 in Panama for 15 new generation aircraft AN-148 and AN-158 for a total amount about \$ 420 million [19].

Interestingly, doing marketing efforts in Paris, concerning demonstration of AN-148 - indeed most perspective today Ukrainian air machine - aviation industry representatives realize independently for the Ukrainian producer of competitive aircraft in its present form in Europe market does not exist. Since production depends on Russian partner and independently from it is impossible to enter the international market. So today transactions are signed by Russian mediator - Russian leasing company Ilyushin Finance Co. (IFC JSC).

But Russian managers from AHK "Sukhoi" promote its Superjet 100 to the European market through European partners: at Le Bourget a contract was signed to supply ten regional aircraft to their first customer - Italian airline ItAli worth 283 million dollars. It should be noted that parallel to AHK "Sukhoi" signed an agreement with the Italian Alenia Aeronautica, Alenia under which come with a 25% stake in a joint venture to promote Superjet 100 at the European and American markets. Span is great because the Superjet 100 aircraft does not exist yet, but the first of the ordered party was in Italy at the end of 2009, the final delivery of the same party is scheduled for 2011 Thus,

because of Russian-Italian cooperation a Ukrainian plane, is displaced that already exists which at Le Bourget was openly admired by representatives of European companies and American company Boeing.

A similar situation was observed in the late 90s, when the Ukrainian manufacturers could not understand why their competitive lightweight AN-32 transport worker lost tenders in Europe to no better CN-295 of SASA. It turned out that the success stories have understandable components. Show the customer his long-term interests, make him a partner, co-owner and member of the production, and he will choose your plane, despite the fact that it is 30-50% more expensive than in competitors [7]

As we can see, in business there is no hard partnerships priorities at the expense of expanding their market opportunities. In domestic business, as some time ago in the British Empire, there are no permanent allies, but there are permanent interests. Naturally, Ukrainian exporters, who have influence on the economic potential of the country, not only hope, but also have good reason to require from the government to remove obstacles in the way of domestic business, generated by political expediency and personal preferences of this or that political force. Establishing good neighbourly relations with partner countries should be the main goal of summits and bilateral meetings.

CONCLUSIONS

The current system of management is characterized by measures search on enterprises reforms, development and implementation of new models and technologies of modern enterprises management. This is caused by deep structural changes in the economy and the realities of modern Ukrainian economic system. The simplest is to use proven models that have been used in the world and may be relevant for Ukrainian enterprises, usually after adaptability to domestic realities.

In the world in general and in Ukraine there is a trend toward larger businesses due to their vertical integration, often international in character. Any organization is a supplier and consumer. It is integrated into the transformation of raw materials into final, delivered to consumer goods and services. The primary motivation for the organization in implementing the strategy of vertical integration is to strengthen its competitive advantages by weakening the competitive strength of suppliers and consumers. In terms of the model of "national rhomb" M. Porter, vertical integration - a way of strengthening relation "organization - supporting the industries"

However, in Ukraine, a country of transition economy, with weak institutional environment and underdeveloped financial markets, there are peculiarities of integration structures formation and motives of their

occurrence. In particular, the phenomenon of Ukraine is other forms of vertical integration, namely vertical integration via cross-shareholdings. Industrial enterprises of some industries are oriented to form a closed cycle of production, as often for the successful implementation of competitive projects there are obstacles as political arguments and dependence on partners from the former Soviet countries, especially from Russia. This applies to former defence enterprises that have successfully completed conversion, activity of which however largely depends on the cooperation ties that were created during the times of the Soviet Union.

Situational analysis of the establishment and effective functioning of the large Ukrainian holding at the energy market proves the acceptability of this approach in the strategic development of Ukrainian enterprises subject on the occasion of effective management and the ability to successfully use all the advantages of vertical integration strategy.

REFERENCES

1. **Akimova I. and Shcherban A.** Stimulating vertical integration in Ukraine // http://www.ier.com.ua/files/publications/Policy_papers/German_advisory_group
2. **Akimova I. and Shcherban A.** Incentives vertical integration // <http://www.amc.gov.ua/amc/control/uk/publish/article>
3. **Badrak V. 2004.** Happen roof for avyaproma. - Military-industrial Courie. - № 18.
4. **Badrak V. 2007.** European Perspectives of Ukrainian Defense / newspaper "Mirror Weekly", June 29. - № 24 (653) 23.
5. **Begma V.M. 1998.** Defense-industrial complex of Ukraine and Russia: cooperation, partnership, competition. - K. NIURO. - 192.
6. **Filippenko A.S., Rogach O.I., Shnyrkov O.I. and others 2000.** World Economy: Textbook. - K. Lybid, Reference list. 93.
7. Materials to expert discussion "Innovative way of development of Ukraine: Slogan or Reality?" - Kyiv, Razumkov Centre, 2004, 7.
8. **Karnozov B. 2004.** Air Show in England has highlighted new perspectives of domestic firms in the global market avitsionnom. - Military-Industrial Courier. - № 30.
9. Defense with vertical Vzlet. Interview V.Horbulyna // 05.03.2002 / http://www.razumkov.org.ua/ukr/files/category_journal
10. **Pashkov M. and Chaly V. 2000.** Realities and perspectives of strategic partnership // Mirror week. - № 22 (320).
11. **Skursky P. 2003** Experience, problems, and restructuring the military-industrial complex of Ukraine. - Current Economic Issues. - № 8, p.58.
12. **Chumak V.M., Begma V.M., Kukyn A.F. and Zaborsky V.L. 1997.** Ukraine and the world arms market. - K. NICD.

13. Official site of Donbass Fuel-Energy Company (DFEC) // <http://www.dtek.com>
14. **Shevtsov V.I. and Bodnarchuk R.V. 2000.** Integration into the military-industrial complex of Ukraine: state and development problems. - Strategic Panorama. – № 3-4,
15. **Shevchenko V. 2001.** Ukrainian-Russian partnership: attempt number five // Mirror week. – № 1 (325).
16. **Shon E. and Baumann H. 2003.** Arms Production - SIPRI Yearbook, 400.
17. Strategic Challenges of the XXI century society and economy in Ukraine / Ed. Acad. National Academy of Sciences of Ukraine VM Geytsa, Acad. National Academy of Sciences of Ukraine VP Semynozhenko, Corr. NAS of Ukraine Boris Kvasniuk. Volume 2: Innovation and technological development of economy. - K.: Phoenix, 2007. - 156.
18. UNIAN Economics of January 27, 2013 // <http://economics.unian.net/ukr/detail/147805>
19. AH-148 // <http://uk.wikipedia.org/wiki/%D0%90%D0%BD-148>
20. <http://www.niss.gov.ua>
21. <http://www.niurr.gov.ua/>
22. <http://www.ukrinform.ua/ukr/order/?id=812643>
<http://pryluky.info/news>