ALVIGO

We Design Success

Alvigo Group of Companies. Corporate Structure

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Mission. Vision. Values of Holding

Mission:

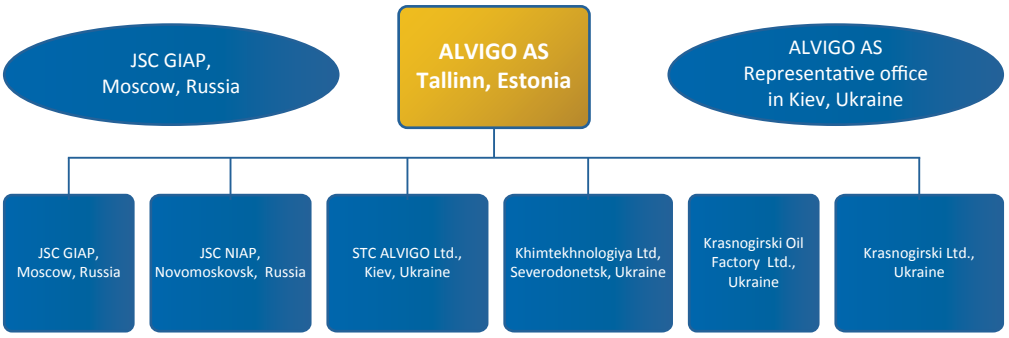
The mission of ALVIGO Group of Companies is to promote the development of chemical industry by using advanced technologies. It is very important for us to contribute to the preservation of a benign environment, which is reflected in the solutions we propose.

Vision:

We strive to become a leading organization offering a full scope of design works and engineering services, including project management services, for creating new chemical plants and revamping existing ones.

Our Objectives:

At all times our task is to find the innovative, best possible solution for each of our Clients. Enterprises of Alvigo Group operate as one team and efficiently in order to provide a full spectrum of solutions in the field of design and equipment supply for petrochemical industry enterprises. Keeping abreast of the times, ALVIGO Group of Companies is continuously developing new solutions, reliability, invulnerability and security of which have been corroborated by many years' experience of design institutes being a part of ALVIGO. We accept only the highest standards and are never satisfied with what has already been achieved – this is the only way to reach perfection.



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MC ALVIGO, LTD

Managing Company Alvigo (MC Alvigo) was established in December 2009 for centralized management of all activities of the holding companies. MC Alvigo has its principal place of business at 50A/8 Zemlyanoi Val Str., Bld.4, Moscow. MC Alvigo has the following key tasks:

- To coordinate activities of Alvigo holding companies
- To define policy and organize the development of enterprise standards
- To organize and control the functional lines of business
- To manage economic planning and financial activities.

AS ALVIGO

AS Alvigo was established in February 1991. Alvigo's office is located in Tallinn, Estonia. Today AS 1996 can be considered as important step in development of the company. This is a year when AS Alvigo began to supply engineering services in the field of chemistry. Today this is one of Alvigo's key focus areas.

2002 to 2008 was a landmark period for the company. Within this period Alvigo proceeded to amalgamation of independent catalyst manufacturing companies and creation of a new integrated customer service concept. Such high-efficiency approach allowed Alvigo to regain the lost positions and to strengthen the existed at that time positions as supplier of integrated package of catalyst products and services following unified standards of Alvigo holding companies.

Stability of Alvigo holding companies is a result of proper planning of the company's goals that is a keystone of future success and prosperity of the company.

Alvigo's key focus areas are:

- Project management
- Cleaning of chemical plants equipment from sludge

In 2011 the company celebrated its twenty-years anniversary. Over the period of its existence the company progressed from metal recycling enterprise and catalyst manufacturer to leader in sphere of design and engineering works and services.

The enterprise has a quality management system corresponding to ISO 9001:2008.

JSC GIAP

STATE RESEARCH AND DESIGN INSTITUTE OF NITROGEN INDUSTRY AND ORGANIC SYNTHESIS PRODUCTS (GIAP) being now JSC GIAP has its principal place of business at 50A/8 Zemlyanoi Val Str., Bld.4, Moscow, 109028.

GIAP was established in 1943 by amalgamation of State Research Institute of Nitrogen (GIA) and Engineering Company for Design of Nitrogen-Based Plants (GIPROAzot). Eight branches were established to deal with specific issues related to nitrogen industry as well as regional issues. These branches were located in Severodonetsk (1949), Dzerzhinsk (1952), Dneprodzerzhinsk (1953), Kemerovo (1954), Novomoskovsk (1956), Chirchik (1959), Grodno (1973), Togliatti (1975). Central Institute as well as its Severodonetsk, Novomoskovsk, Dzerzhinsk and Dneprodzerzhinsk branches had semi-commercial plants. In 1976 GIAP was awarded the Order of the Red Banner of Labour. Since 1992 all branches have become independent research organizations of Russia and CIS countries. In 1994 Central Institute was re-organized to JSC GIAP. JSC GIAP focuses on research and design of process technologies and equipment for the plants producing ammonia, methanol, natural gas-based acetylene, hydrogen and its isotopes, various synthesis gases, nitric acid, nitrogen fertilizers, caprolactam, adipic acid and other dicarboxylic acids, substances for production of some pharmaceuticals, catalysts, high-purity substances, etc.

Over the years of its existence GIAP created the world's largest nitrogen industry with advanced technical level based on the developments made by its scientists and engineers. About 70 ammonia plants with capacity range from 55 to 450 thousand tons were designed and built. 22 ammonia plants with capacity of 450000 tpy, 87 weak nitric acid plants with capacity of 120000 tpy, 12 AK-72 nitric acid plants with capacity of 380000 tpy, 23 ammonium nitrate plants, 6 caprolactam plants with capacity of 50-80 ths tpy, 15 methanol plants with total capacity of 3664 ths. tpy, 5 acetylene plants are operating now in Russia and CIS countries. The unique ammonia pipeline Togliatti-Odessa which allows to export liquid ammonia to many regions of the world is constructed. The production facilities of nitrogen industry designed by the Institute are built in Afghanistan, Bulgaria, Germany, China, Cuba, Romania.

Two heavy water plants using liquid hydrogen rectification method are built based on the designs elaborated by the Institute. The scientists and engineers of the Institute made a considerable contribution to development of liquid hydrogen filling station for space system "Buran-Energy".

To deal not only with engineering issues but also with the issues related to industrial safety expert review of equipment and technical documentation the Scientific & Technical Center (STC) was established at JSC GIAP. The expert activities in sphere of industrial safety of mineral fertilizer plants and allied branches of chemical industry are the tasks of this center. STC specializes in sphere of general metallurgy, material strength and structural integrity, welding, corrosion protection. The center has a certified NDT laboratory conducting technical diagnostics in order to evaluate the actual technical condition of equipment. The center performs the following activities on industrial

safety expert review:

- expert review of design documentation for major hazard facilities;
- expert review of equipment at major hazard facilities;
- expert review of industrial safety declarations;
- expert review of other documents related to operation of major hazard facilities.

In order to do expert examination of technical condition and forecast residual life of the equipment the experts of STC of JSC GIAP use state-of-the-art NDT methods and tools such as acoustic emission, thermal vision, ultrasonic, magnetic (including metal magnetic memory method), capillary as well as methods of determining mechanical properties with sample and without sample, metallographic and corrosion examinations of metals. Based on examination results they do equipment strength and stability analysis considering operating conditions and actual loads as well as possible changes of material mechanical properties during operation followed by residual life forecasting.

New focus areas of STC of JSC GIAP in sphere of industrial safety expert review appeared in recent years:

1. Expert examination of technical condition of large-capacity plants in order to prolong time between overhauls. After completion of this work at JSC Akron, JSC Novomoskovsk Azot and JSC Nevinnomyssk Azot their ammonia and urea plants are successfully operating now with overhaul life extended to 2-3 years that allows gaining experience and information for future studies.
2. Obtaining a permit for use of equipment at major hazard facilities of chemical, petrochemical and allied industries including package units that significantly expands the opportunities of international cooperation for industrial enterprises.

JSC GIAP also has Process Equipment Cleaning Department (PECDept.) which provides services for non-destructive and destructive physical-chemical and mechanical cleaning of operating and dismounted equipment of nitric acid, hydrocyanic acid and hydroxylamine sulfate plants to remove sludge containing precious metals. Constantly improving the work methods, PECDept. of JSC GIAP is a leader of this service market. PECDept. of JSC GIAP has wide experience in chemical equipment cleaning and utilization of wastes containing platinum group metals (PGMs). More than 200 cleanings to recover PGMs were conducted. Several tons of precious metals were recovered and collected as a result. Due to cleaning operations Client recycles up to 50% of platinoids - weight losses of the catalytic gauzes during plant operation.

In practical work PECDept. of JSC GIAP uses various techniques such as destructive and non-destructive, mechanical and chemical cleaning methods as well as proprietary reagents that finally ensures high degree of cleaning with full residual life guarantee for the cleaned equipment. To perform cleaning operations PECDept. of JSC GIAP designed and built the unique mobile production units (MPUs) which no one of competitors has anything similar to.

PECDept. of JSC GIAP is the only company at the market of CIS countries which offers and successfully performs the high-efficiency physical-chemical non-destructive cleanings at large-capacity nitric acid plants including AK-72. The cleaning is conducted using innovative methods without dismantling of heat exchangers that makes possible to reduce the plant downtime for cleaning to 5-6 days instead of one month in case when catalyst gauze packs are replaced.

JSC GIAP provides services to the enterprises included in such largest industrial holding groups as Eurochim, Akron, Uralchim, Fosagro, etc. Our permanent partners and clients are JSC Akron, Velikiy Novgorod; JSC Dorogobuzh, Verkhnedneprovsky, Smolensk Reg.; JSC Novomoskovsk Azot and JSC Novomoskovsk Chlorine, Novomoskovsk; JSC Nevinnomyssk Azot, Nevinnomyssk; JSC Mineral Fertilizers, Perm; JSC Voskresensk Mineral Fertilizer Plant, Voskresensk; JSC Azot,

Berezniki; JSC Mineral Fertilizer Plant of Kirovo-Chepetsk Chemical Complex, Kirovo-Chepetsk; JSC Cherepovets Azot, Cherepovets; JSC Shchekinoazot, Shchekino; JSC Mineral Fertilizer Plant, Rossosh; JSC Salavatnefteorgsynthesis, Salavat, and others.

JSC GIAP has in hand all necessary certificates authorizing development of design documentation influencing the safety of capital construction projects, in particular, for especially hazardous, technically complex and unique projects. Quality of the works meets the ISO 9001 requirements and is confirmed by an appropriate certificate.

At present JSC GIAP is one of the leading research and design organizations in its field. JSC GIAP has more than 100 employees including 2 Grand philosophy doctors. For the last five years JSC GIAP has carried out a considerable scope of works on revamping of ammonia, nitric acid, ammonium nitrate plants, aimed at reduction in consumption figures and contaminants emissions into atmosphere, updating of existing plants, etc..

Having highly qualified specialists, using their wide experience and expertise as well as information potential of the Institute, JSC GIAP is willing to solve any design tasks from selection of construction site through commissioning.

Scientific & Technical Center "ALVIGO", Ltd.

Limited Company "Scientific & Technical Center "Alvigo" (STC Alvigo) was established in June 2002 in Kiev as part of ALVIGO Holding. Now STC Alvigo has a 25 person staff.

STC Alvigo, Ltd. has gathered a team of experienced engineers, representatives of the best enterprises, research and design organizations of Ukraine who feel great security on the market of research and engineering services for chemical enterprises.

The core business lines of STC Alvigo are as follows:

- development and introduction of new non-concentrated nitric acid technologies;
- modernization of operating non-concentrated nitric acid and ammonia plants;
- manufacture and introduction of state-of-the-art high-quality process and power equipment;
- marketing research;
- R&D;
- engineering.

The most important achievement of STC Alvigo is the creation of the gas turbine unit of new generation GTU-8 for UKL-7 nitric acid plant. Beginning in 2002 JSC "Energy" (Krivoy Rog) developed the detailed design documentation based on technical assignment and in 2004 the first gas-turbine unit GTU-8 was manufactured. After bench tests in 2005 this gas-turbine unit was supplied and put into operation at JSC Nevinnomyssk Azot, Nevinnomyssk, Stavropol Territory, RF.

GTU-8 is gas-turbine unit in which:

- one-stage air compression is realized;
- the latest achievements of turbine building industry are incorporated;
- the latest achievements in electronics are used in the control system;
- advanced heat-resistant steels are used.

The use of GTU-8 instead of outdated GTT-3M allowed to essentially enhance reliability

of the nitric acid plant, improve its economic indicators due to significant reduction in utilities consumption, which is especially important at notable increase of their cost in all CIS countries where UKL-7 scheme-based nitric acid plants are operated.

It should be noted that the use of GTU-8 instead of GTT-3M at construction of new nitric acid plants UKL-7 shows significant economic benefits. So, the payback period for GTU-8 is within 0,4 – 0,5 years depending on the cost of utilities.

GTU-8 operation experience, which is already over 6 years, demonstrates that the product is reliable in operation, does not need operator intervention, is technically and ecologically safe, certified for use in explosion-hazardous plants.

KHIMTEKHNOLOGIYA, LTD

The history of Khimtekhnologiya, Ltd. goes back to 1950. The Institute was established as the Lissichansk affiliated branch of the State Research and Design Institute of Nitrogen Industry and Organic Synthesis Products (GIAP). The first of April 1950 is the business startup date of the branch. In 1963 it name was changed to the Severodonetsk affiliated branch of GIAP. On 29 October 1991 the Institute was renamed State Research and Design Institute of Chemical Engineering "Khimtekhnologiya".

In 2006 research and design sectors of the Institute were separated into the State Enterprise "Institute of Nitrogen Industry and Organic Synthesis Products" (SE "IAP").

In 2008 Limited Company "Research and Design Institute of Chemical Engineering "Khimtekhnologiya" was founded.

The place of business of Khimtekhnologiya. Ltd. is Severodonetsk, Ukraine.

Today Khimtekhnologiya, Ltd. employs 350 persons. The Institute has 12 design departments capable to develop doecumentation for all project parts. The development department is engaged in development of new processes, prepares initial design data.

During its existence Khimtekhnologiya, Ltd was an integrated research and design institute whose tasks consisted in the development of modern technologies for production of chemical products, in the design of the plants and designer's support during their operation. Today the Institute maintains its status of a leading design and engineering company in the field of chemical engineering.

A whole pleiad of noted scientists, philosophy doctors, grand doctors of philosophy grew up in the Institute. Its directors A.Masterov, S.Shtefan, V.Novitsky, P.Borisov made a great contribution to its development at different stages. In different years over 300 employees of the Institute were honoured with state awards, among them 17 laureats of USSR and UkrSSR State Prize in the field of science and technology.

During its history the Institute has commercialized a number of process technologies for mineral fertilizers production and organic products synthesis. All ammonium carbonate-bicarbonate and potassium nitrate plants operating currently in the CIS countries were built based on the Institute's designs. The first three modern ammonia plants were built in cooperation with ENSA company in Cherkassy, after that another 11 similar ammonia plants with a capacity of 600 t/day were

commissioned in Rovno, Cherkassy, Rustavi, Shevchenko, Kokhtla-Yarve, Marakh (total capacity being 2200 thousand tons per year) using home-made equipment. The Institute developed technical documentation for construction and commissioning of 16 large-scale ammonia plants with a capacity of 1360 t/day using complete imported equipment and of two plants using home-made equipment.

The Institute specializes in methanol production technology. It has qualified specialists in this field, which makes possible to carry out the complex works aimed at methanol technology developments including catalyst systems and equipment for natural gas reforming stages. Four M-100 methanol plants (in Severodonetsk, Novomoskovsk, Nevinnomyssk, Shchekino) with a capacity ranging from 100 to 200 thousand tons of refined methanol per year constructed in the 1970s based on the designs developed by the Institute are being operated currently in CIS countries. The Institute has developed the state-of-the-art methanol synthesis technology that allows to significantly intensify the process. The methanol catalyst developed y the Institute is as good as the best foreign standards.

The Institute made a great contribution to the development of acetylene production based on oxidative pyrolysis of natural gas being the basic raw material for production of the most important chemical products.

The results of integrated activities of the Institute allowed to create a domestic 30,000 tpy adipic acid plant. Construction of hexamethylene diamine and SH-salt production complex at Rovno Azot should be viewed as achievement of the Institute. The SH-salt production technology based on continuous scheme using aqueous solution was commercialized in the world practice for the first time.

Over the recent years the Institute has developed the designs for revamping of ammonia plants in Cherkassy, Gorlovka, Dneprodzerzhinsk, Grodno, Rovno, Jonava (Lithuania). The methanol plant in Jonava, the acetic acid plants in China and Iran were successfully started up. We developed the designs based on which the construction of acetylene plant in China, methanol plant in Nizhny Tagil, ammonia and methanol plant in Mendeleevsk is under way. In October 2011 the 450,000 tpy methanol plant constructed based on the Institute's design documentation was commissioned in Shchekino. Khimtekhnlogiya, Ltd. is carrying out design works for nitric acid plants at Rovno Azot, for 3 new acetylene plants having different capacity for China, etc..

Khimtekhnologiya Ltd. has the following certificates and licenses:

- License No. 445424 of the Ministry of Regional Development and Construction of Ukraine for economic activities related to the creation of architectural objects
- License No. 457138 of the State Department of Fire Safety of the Ministry of Emergency Situations of Ukraine for design, installation, technical support services for fire safety and heating facilities, fire safety assessment of objects .
- Certificate 01-П No. 075 of Trans-Regional Association of Design Organizations for Special Construction (the Russian Federation) "On work order authorization for design works influencing the safety of capital construction projects".

Khimtekhnologiya, Ltd. is one of the leading research and design organizations in the field of development of technologies and construction of chemical production facilities. At present Khimtekhnologiya can be named without a doubt the largest institute of chemical industry in CIS countries.

JSC NIAP

Open Joint-Stock Company "Novomoskovsk Institute of Nitrogen Industry" (JSC NIAP) was established on the 1st of October, 1958 as Novomoskovsk branch of State Research & Design Institute of Nitrogen Industry and Organic Chemicals (GIAP, Moscow). In the peak of its activity GIAP incorporated 8 branches throughout the territory of Russian Federation and other SU Republics. Its staff amounted to over 12 thousand workers. Novomoskovsk branch of GIAP was one of the biggest and had about 2 thousand employers. The integrated structure of Novomoskovsk branch comprising design and research divisions as well as catalyst pilot plant ensured the most effective and short-time development and commercialization of state-of-the-art process technologies, accomplishment of a wide spectrum of works in the territory of SU and abroad.

During its first years a process-oriented profile of NIAP was set, namely catalysts. For many years the priority areas for Novomoskovsk branch of GIAP were R&D, technological developments, pilot works, engineering and design efforts in development and commercialization of catalyst manufacturing processes. Considerable part of industrial catalysts used in ammonia plants, inorganic, organic and ecological catalyses were developed and produced. Institute's developments were effectively employed in more than 250 enterprises of chemical, petrochemical, electrical and other industries. In parallel the Institute was engaged in the development of ammonia, hydrogen, NG reforming, associated gas conversion projects, chemical, low-temperature, refrigeration and other processes.

Novomoskovsk branch of GIAP was reorganized into Open Joint-Stock Company "Novomoskovsk Institute of Nitrogen Industry" (JSC NIAP) which became its successor.

Since 2008 major JSC NIAP activity has been design of industrial plants for chemical and other industries as well as of social facilities.

Based on our designs hundreds of plants have been constructed and are successfully operated in Russia, CIS countries, Lithuania, Latvia, Cuba, Germany, India, Bulgaria, etc. The Institute is experienced in cooperation with companies from the USA, France, Japan, Germany, Belgium. For many years the Institute functioned as general designer for the largest enterprises of nitrogen industry (Novomoskovsk JSC Azot, JSC Dorogobuzh, Rossosh JSC Minudobreniya, Ventspils port works, etc.), which allowed to gain a great experience in revamping and updating of operating plants using the present-day scientific achievements in the process technology.

JSC NIAP participated in design and construction of a unique project, i.e. ammonia pipeline Togliatti-Odessa with the length over 2000 km, to which a branch line from Rossosh JSC Minudobreniya was connected in 2006. A branch line from this ammonia pipeline to Balakovo branch of JSC Apatit is under design now.

By design of JSC NIAP an interplant ammonia pipeline about 15 km long was constructed and is being successfully operated by JSC PhosAgro-Cherepovets.

NIAP's recent major works include:

- Development of authority engineering and detail design documentation for revamping of urea production shop 2A of JSC Nevinnomyssk Azot to increase its capacity to 1500 t/d;
- Development of authority engineering and detail design documentation for erection of two UKL-7 nitric acid units to replace demounted equipment for JSC Nevinnomyssk Azot;
- Development of authority engineering documentation for construction of ammonia and methanol coproduction plant, isothermic liquid ammonia storage integrated in ammonia, methanol and urea production complex within industrial area of Mendeleevsk, the Republic of Tatarstan;
- Development of authority engineering and detail design documentation for liquid ammonia storage with capacity of 8000 tons for Balakovo branch of JSC Apatit;
- Development of authority engineering and detail design documentation for 700 ktpy ammonia plant for JSC Acron, Veliky Novgorod.

For our more detailed reference list please refer to our web-site www.niap.novomoskovsk.ru.

JSC NIAP is an integrated design organization comprising design and business departments. Efficient organization structure provides for integrated development of authority engineering and detail design documentation in all parts and sections at all project stages, support during expert review of authority engineering documentation, designer's supervision during construction, participation in start-up and commissioning of the plants, elaboration of process regulations and other operating documentation.

Since 2009 JSC NIAP has been a member of Self-Regulating Organization Nonprofit Partnership "Interregional Association of Design Engineering Companies for Special-Purpose Construction" (SRO SP "MOPOSS"), it was certified with a competency certificate for design works effecting safety of capital construction projects including major hazard and technically complex facilities. JSC NIAP staff amounts to more than 200 workers.

In April, 2010 the QMS of JSC NIAP was successfully certified for conformance to requirements of GOST R ISO 9001-2008. The certification audit resulted in the resolution of commission of certification authority (Tula Quality Management Centre, Ltd.) stating that NIAP's QMS conformed to requirements of GOST R ISO 9001-2008 relating to development of design products, and the Certificate of Conformity was issued. In 2013 the QMS incorporated in the Institute was recertified for compliance with the requirements of GOST ISO 9001-2011 (ISO 9001:2008) and obtained the Certificate of Conformity.

JSC Novomoskovsk Institute of Nitrogen Industry is open for discussion and willing to cooperate. Our motto is "We design success".

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