



INTERVIEW WITH V.G. SUBBOTIN, DIRECTOR GENERAL OF OJSC TURBOATOM

Viktor Grigorievich, under your leadership TURBOATOM has substantially strengthened and promoted its positions in the world market of equipment for nuclear, heat and hydraulic power stations. What are the economic indices that characterise operation of your Company?

In 2012, the return from realisation of products was 1.4 Billion UAH at a growth rate by 2010 equal to 136.7 %. Specific weight of export in the volume of the realised products was 67 %. The total amount of money which TURBOATOM transferred to the state and local budgets in the form of taxes and other payments was 256.2 Million UAH. According to the results of work in the first quarter this year, the growth rate is about 45 % relative to that of the same period last year.

What is the average monthly salary of the operating personnel at TURBOATOM?

Increase of the output provided a big profit, which led to a corresponding growth of salaries. Compared to the same period last year it amounts to about 12 %. The average monthly salary of the operating personnel is 3447 UAH, and that of the main production workers is 4803 UAH. This is one of the highest salaries in the engineering industry of Ukraine. The operating personnel works at the main workshops in full three shifts. The mean age of workers at TURBOATOM during the last five years decreased from 51 to 44 years.

Viktor Grigorievich, how did the accident at NPP in Japan affect the volume of orders for nuclear power engineering?

The accident at NPP in Japan exerted almost no effect on development of nuclear power engineering and volume of orders which TURBOATOM performs. The stock of orders our Company receives consists of real contracts, their volume continuously grows and amounts today to 3 Billion UAH. In the nearest future we are expecting a number of the new paying orders.

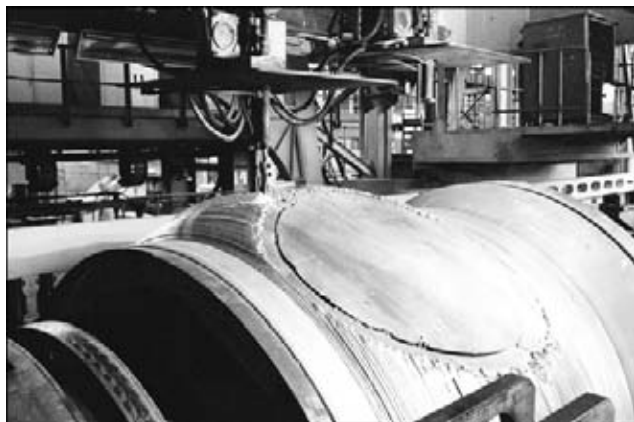
What heat, nuclear and hydraulic power plant equipment has your Company manufactured and shipped this year?

- Three steam turbines with a total capacity of 748,000 kW for unit 6 of the Heat Power Plant



in Aksu (Kazakhstan), unit 5 of the Starobeshevskaya HPP, and unit 8 of the Kurakhovskaya HPP (Ukraine);

- condenser and four rotors for unit 3 of the Rostov NPP (Russia);
- assemblies and components for upgrading of the condenser for HPP in Aksu (Kazakhstan);
- four sets of upgraded turbines K500-65/3000 for NPPs in Russia;
- power equipment for unit 1 of Zaporozhie HPP and unit 4 of Zuevskaya HPP (Ukraine);
- sets of power equipment for upgrading of the Nazarovskaya State Regional Power Plant, Rostov NPP, Balakovskaya NPP, Irkutsk HPP (Russia), and HPP in Habana (Kuba);
- three hydraulic turbines of a total capacity of 192,000 kW, including for DneproGES, unit 13; Dneprodzerzhinsk HPP, unit 2; and Kanevskaya HPP, unit 2 (Ukraine);
- propeller and parts for Kremenchug HPP 2 (Ukraine);
- embedded parts for Kamskaya HPP 15, Gotsatlinskaya HPP and Novosibirskaya HPP (Russia);



• sets of power equipment for upgrading of Kamenskaya HPP and Nurekskaya HPP (Tajikistan).

Viktor Grigorievich, TURBOATOM has made the biggest contract in its history for manufacture of equipment for Rostov NPP. What this contract is about?

Our Company received an order for manufacture and delivery of the 1100 MW steam turbine with a condenser for unit 4 of Rostov NPP. The amount of the transaction is above 120 Million US Dollars. This is really the biggest contract in the entire history of TURBOATOM. The bidding conditions for this contract were very stringent. The fact that two power units with the TURBOATOM turbines are already operating to advantage at Rostov NPP, and that designs of the operating turbines are characterised by a high degree of reliability, also added to our success.

Substantial increase in the rates of development of TURBOATOM requires upgrading of the process equipment and application of the advanced technologies?

TURBOATOM systematically provides upgrading of its equipment. Our Company spent 35 Million UAH for re-equipment in 2010 and 57.4 Million UAH in 2011. For example, we purchased the latest metal cutting machine tools and welding equipment. This year we have planned

to spend above 70 Million UAH for upgrading and R&D.

Which new welding processes is your Company mastering?

Recently we have applied several new technologies at TURBOATOM. For example, this is the technology for electric arc spraying of hydraulic turbine parts, and the orbital welding technology which we used to manufacture condensers with titanium and stainless steel tubes for Rostov, Balakovskaya, Kalininskaya and Novovoronezhskaya NPPs.

With the assistance rendered by specialists of the E.O. Paton Electric Welding Institute and National Technical University «Kharkov Polytechnic Institute» (R&D leaders — A.K. Tsaryuk and V.V. Dmitrik), we are introducing a new welding technology for manufacture of forged-welded medium-pressure rotors for turbines K-325. Design peculiarity of such rotors is that they consist of two parts joined by automatic welding. One part of the rotor is made from steel 20Kh3MVFA, and the other — from steel 25Kh2NMFA. Therefore, for the first time in turbine construction, to make rotors we used the technology of welding dissimilar steels, which differ in the level and heat resistance. Application of such rotors is stipulated by the fact that in the process of their operation one of the rotor





parts is heated to a temperature of 350 °C and the other part — to 560 °C. Design embodiment of the new rotors manufactured on the basis of the R&D results provides increase in their vibration resistance and reliability during operation.

As far as the equipment is concerned, we are upgrading the gas and plasma cutting lines. By now we have upgraded two gas cutting units of the «Messer Griesheim» Company, and we are holding a bid for upgrading the plasma cutting unit. For the auxiliary production, we have bought and applied the equipment for butt welding of tools.

The President of Ukraine posed a task for TURBOATOM to deliver equipment for upgrading of the Dnepropetrovsk cascade hydro-electric engineering facilities. How performing of this most important order for the economy of Ukraine is going on?

TURBOATOM is upgrading the entire Dnieper cascade, and it includes 100 hydraulic turbines. By today we have already reconstructed more than a half of them. In 2009 the first hydraulic unit of the Dnestrovskaya hydroelectric pumped storage power plant was commissioned, and today we are successfully upgrading the second hydraulic unit, the main strategic object of Ukraine. This is a considerable workload. After all, the weight of one hydraulic turbine is about 1500 t. And the substantial share of labour input is accounted for by performing welding operations.

I want to assure the President that the team of TURBOATOM will do its best to accomplish this task, which is very important for the economy of Ukraine, before the Power Engineer Day next year.

The interview was recorded by Doctor of Technical Sciences V.V. Dmitrik

The Kharkov Turbine Factory was built only for three and a half years, and was commissioned on the 21st of January 1934. This was the beginning of counting out of glorious victories of the Kharkov turbine constructors. As early as in 1935 the first steam turbine with a capacity of 50 MW was taken from the Factory rack, and the steam turbine with a capacity of 100 MW and the generator for it were manufactured in 1938, which were the highest power turbines at that time.

Today OJSC «TURBOATOM», being the head scientific organisation of the Ministry of Industrial Policy of Ukraine in power machine building, is among the leading turbine construction companies in the world.

The Company is specialising in production of turbines for heat and nuclear power stations, heat-electric generating plants, hydraulic turbines for hydroelectric power stations and hydroelectric pumped storage power plants, gas turbines and combined-cycle plants for heat power stations and other power equipment.

Manufacturing capabilities make it possible to produce annually steam and hydraulic turbines with a total designed capacity of 8 and 2 mln kW, respectively. Turbines are manufactured by the closed cycle: from development and research work to manufacture, assembly, testing of turbines and their shipment.

Internal audits by the Quality Management System at the Plant are performed annually, thus proving its effectiveness. The initial audit at TURBOATOM took place in 1996, and up to now, i.e. during 15 years, the Company has been confirming compliance of the Quality Management System with International Standard ISO 9001.

The sphere of certification includes: design, manufacture, supervision of erection and service of stationary steam turbines, combined-cycle plants, hydraulic turbines, pre-turbine gates, smoke exhaust ventilation heaters, steam turbine condensers and ejectors.

The fact that TURBOATOM has the Certificate of Conformance issued by the Independent Australian Company SAL GLOBAL allows it to compete on equal terms with the world-leading manufacturers of turbine construction equipment, take part in bids and win them.