OAO LEPSE SOUTH KAMA MACHINE-BUILDING
PLANT – AN OIL AND GAS COMPLEX

Yu. A. Shirinkin

OAO Lepse South Kama Machine-Building Plant is one of the major manufacturers of pipeline fittings and wellhead equipment for oil and gas wells.

For many years, the plant has gained considerable experience with the development, mastering, and production of various products for the chemical, oil-refining, and oil and gas industries, pipeline transport, and public utilities. New economic relations with a large number of consumers have predetermined high responsibility for the quality and technical refinement of manufactured products, and the development of production. Beginning with the 1990s, many new, primarily converted, establishments that have gone into the manufacture of this same equipment have appeared in the market place. Moreover, the number of offers made by foreign firms concerning deliveries of similar products to Russia has increased. Demand for the plant’s production has fallen off, particularly for wellhead equipment of the petroleum industry in this connection, and also due to the overall economic downturn.

And, in spite of everything, the plant continues to function, struggling for its own survival. Here, the plant is helped by its centuries-old tradition (the plant is 253 years old), rigging with modern production equipment, and a comprehensive management policy toward modernization of production and expansion of the list of articles manufactured, as well as refinement of production procedures.

The plant has cooperated actively with basic-product consumers over a period of many years. In that case, many demands of consumers relative to the updating of products and the modernization of series-produced articles have been defined more precisely.

Among other things, the list of steel wedge gate valves has been expanded. The ZKL3 and ZKLP3 types of wedge gate valves with a dual-disk wedge, which provides for stable Class A and C airtightness of the gate (GOST 9544), had been abandoned in production. One does not need to apply large forces to the flywheel to control the gate valve; this reduces the contact stresses on the sealing surfaces of the gate valve, owing to which their wear is reduced and operational reliability increased. Problems involving the delivery of gate valves to the consumer for installation on pipelines transporting gaseous media have been resolved.

According to technical documentation drafted by the plant’s design office, the series production of gate valves for use in cold climates has been initiated. The gate valves are furnished for the production systems of organizations located in northern regions of the Tyumen and other oblasts. Here, the types of gate valves with drives have been expanded: in addition to an electric drive, it is possible to mount a pneumatic drive on the valve.

A structural modification of the gate valve with a linear-displacement electric drive (manufactured by the AO “Znamya Truda”) has been developed in cooperation with the Central Design Bureau Administration (Saint Petersburg).

The advantages offered by these drives over multiple-thread drives are as follows:

- a reduction in dynamic loads transmitted onto the fitting;
- a reduction in the absolute values of the starting currents; this lowers the electrical-energy demand and increases the number of start-ups per hour; and,
- rapid opening and closure of the gate valve when controlled from a manual doubler, etc.
The gate valves are basic products of the plant’s production activity. During the period from 1943 through 1998, it produced and shipped 3,896,930 gate valves to consumers. The highest volume of gate-valve production (130,768) was achieved in 1987.

Other forms of stop valves are also manufactured in addition to the gate valves: conical self-lubricating cocks, heated cocks, three-way cocks, etc.

Much has been accomplished and done in the field of applying wellhead equipment to the oil-extraction industry. Its utilization was initiated in the mid-1960s. At that time, the country was experiencing an acute shortage of wellhead equipment, since new oil fields had been exploited, and active drilling was underway in previously explored areas. Three institutes were responsible for design during the initial stage of wellhead equipment production: the AzINmash and VNIIPTneftemash (Baku), and the TatNIIneftemash (Kazan'). The manufacture of gusher fittings and other wellhead equipment was organized in a very short time. Designs and procedures were finalized, and the production base developed in tooling up for production. The plant coped with deliveries, bringing the production of gusher fittings to 5,535 sets in 1987. A total of 92,595 sets of wellhead equipment were produced in 1966–1998. It is difficult to name an oil region where our equipment would not be operated at a pressure of 14 MPa with a conditional passage diameter of 65 mm. The largest number of wells fitted with the plant’s equipment are located in the region of Western Siberia.

Plant specialists are always searching for new, technically significant solutions to the modernization of series-produced articles, and also to the creation of new product lines. Work is being performed in close contact with oil producers. Their suggestions that take characteristic features of a specific oil region into account with respect to the design and changes in the schemes used to assemble the equipment or complete set, are implemented without fail in filling orders. The cooperation with the AO Surgutneftegaz, which has continued for 40 years, is an example of model interaction between fabricator and consumer. This does much, and, above all, about the confidence bestowed in the plant – the manufacturer of products that have been checked intermittently and operated successfully in oil fields under difficult industrial conditions.

The products fabricated by the plant are used in gusher, electric-pump, and piston-pump wells under an operating pressure to 14 MPa. In terms of variety of shut-off devices employed in wellhead equipment, our plant excels other manufacturers of similar products. Equipment is furnished with cocks having a conical self-lubricating plug, ball cocks, and oil-filled gates on order, and angle valves when required. The equipment has two modifications: for a moderate climate, and cold climatic zones.