

Pioneer work in Kiev:

A century of diesel power plants

Augsburg, 12 May 2004. A 100 years and 25 000 HP lie in between the first engines for diesel power plants and their state-of-the-art successors of today. In 1904 the world's first diesel power plant, equipped with MAN engines, started operation in Kiev. Each of the four engines, ordered by the Kiev tramline administration, delivered 400 HP. An annual plant capacity of 3.6 million kilowatt hours (kWh) was required. A hundred years after this impressive pioneer work, the largest diesel power plant in MAN B&W Diesel's company history will start operation: The CHOLOMA III power plant in Honduras, which is equipped with thirteen 18V48/60 engines with a total output of over 245 megawatt, will supply 500 times the energy amount of the former Kiev power plant to the Honduras mains supply. Each of these engines offers a capacity, which is approx. 65 times that of their Kiev predecessors a hundred years ago.

In 1901, the MAN representative in Russia, Engineer A. Berlant, was informed that the Kiev tramline administration in the Ukraine envisaged the extension of their old "Alexandrowskaja" power plant, where three steam engines of 200 HP, each were run. Firstly the Kiev administration talked about the purchase of two state-of-the-art steam engines with 600 HP each. Early in January 1902, Berlant informed the company management of the Augsburg location of this project and, four weeks later, MAN decided to convince the Kiev tramline administration of the Diesel solution, focusing on the considerably lower fuel costs.

Such a high output had never before been realised for one individual customer. According to a sales list, the Augsburg

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DIESEL

and Nuremberg works had only received orders for, resp. delivered, 102 cylinders, totalling 4 000 HP by the end of 1902. An output of 1 600 HP for Kiev meant more than a bulk order. Also with regard to technical and commercial aspects, MAN had to break new ground.

The Kiev tramline administration claimed oppressive guarantees: MAN was obliged to guarantee operation of the engines over a period of 5 years on the basis of the lowest fuel costs at their own risk, maintenance and possible repairs included. With regard to the sixth year, the tramline administration claimed further guarantees.

A further requirement was that an MAN works superintendent had to attend the 16 hour operating time of the engines. The young Augsburg technician, Anton Aechter, was only off every second Sunday, however, only until 18:00 hrs.

The project involved incalculable risks. At that time, a letter dated 17 July 1902, referring to the Kiev power plant, addressed to MAN Augsburg read as follows:

Among other things, we are not aware of the influence small defects or leakages in the control parts of the engine may have on the fuel consumption. We do not know whether such leaks may occur frequently. Contrary to steam engines, we do not have any experience with regard to the costs incurred for Diesel engine operating personnel. Even more uncertain is the question of what costs are to be calculated for maintenance and necessary repairs of this engine in order to be on the safe side.

MAN decided to take the risk. In the afternoon of 20 November 1902, Berlant sent the following telegram to Augsburg: *“My compliments to yesterdays order confirmation received from tramline administration – letter of Komerowskaja*

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will be sent this evening – Berlant". MAN Augsburg had secured the first diesel engine bulk order: four diesel engines of the DM4x100 type, each with an output of 400 HP at a speed of 160 rpm. The engines had a 45 cm bore and a piston stroke of 68 cm, an average piston speed of 3.6 m/sec and a mean effective pressure of 3.6 bar. As only one and two-cylinder engines had until then been produced in Augsburg, each engine unit consisted of two attached two-cylinder engines. Delivery of the four engines was effected to Kiev during the period from August 1903 to February 1904. The sales price of the four generator sets was approx. 854.000 Mark and the total weight amounted to about 275 tons, some 69 tons per engine.

As from 12 May 1904, the new diesel engine power plant supplied electrical energy for the municipal trams. It proved that the annual saving in the operating costs amounted to over 200 000 Mark as compared to the previous steam engines.

Already after quite a short time, the Kiev municipal tramline administration was very satisfied with the engine operation and ordered two further diesel engines of the same type and output in 1906 in order to extend the "Alexandrowskaja" power plant to 2 400 HP. Delivery of the generator sets was carried out in spring 1907. Further proof of the great customer satisfaction was that Kiev was content with a shorter guarantee period for this follow-up order so that the warranty time for all six engines expired more or less at the same time.

Years later, Kiev decided to build a second power plant, "Lukianowska", for which MAN once again delivered four DM4x100 engines with a total output 1 600 HP in 1910 and 1911. Already in October 1912, resp. February 1913, two further MAN engines of the CL80 type, with an output of 600 HP each, were ordered for the extension of the "Lukianowska"

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power plant. Concerned were horizontal, double-acting two-cylinder engines.

The Kiev engines, which were delivered last, were running until 1955, when they were finally disassembled and scrapped – some of them after a long service life of 51 years!

The two power plants in Kiev with their diesel GenSets became notable reference plants, which were frequently visited by customer delegations and trade journalists from all over the world. At that time, Kiev had developed into some kind of diesel engine place of pilgrimage and, as a visible witness for the reliability of the new technology, made a valuable contribution to the diesel engines' worldwide triumphant march.

The latest stage of this story of success is the Honduras power plant.

About MAN B&W Diesel

The MAN B&W Diesel Group is leading supplier of large Diesel engines for marine propulsion and power stations with unit outputs of up to 97 MW per engine. The two-stroke and four-stroke engines produced by MAN B&W Diesel and their licensees are, with a market share of approx. 50 percent, leading on the world market with regard to propulsion of large ocean-going vessels. Moreover, the company is one of the leading suppliers of Diesel power stations and turbochargers. The Group Division, with approx. 6 700 employees and manufacturing plants in Germany, Denmark, England, France, the Czech Republic and China achieves an annual turnover of approx. 1.4 billion Euro. MAN B&W Diesel is a subsidiary of the MAN Aktiengesellschaft, Munich. The MAN Group is one of the leading European suppliers of capital goods in the fields commercial vehicles, constructional engineering and engineering contracting with a turnover of approx. 13.5 billion Euro and 64 000 employees.

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