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CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

25X1A [redacted]

REPORT NO.

CD NO.

COUNTRY USSR

DATE DISTR. 24 AUG 51

SUBJECT The NKMZ in Kramatorsk

NO. OF PAGES 5

PLACE ACQUIRED 25X1A [redacted]

NO. OF ENCLS. (LISTED BELOW)

DATE OF INFO. [redacted] 25X1X

SUPPLEMENT TO REPORT NO. 25X1A [redacted]

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[redacted]

1. The entire plant equipment of the NKMZ (Novo Kramatorski Zavod Tyazhelogo Mashinostroyenia imeni Lenina) was built in the 1930s. [redacted] 25X1X 25X1X [redacted] the equipment generally speaking was in good working condition, mostly because it had been put into operation gradually.

2. The NKMZ had a large and well-equipped mechanical repairs shop (shop # 4). The office of the chief mechanic assisted by shop mechanics, was responsible for the maintenance and repair of equipment. They made routine inspections 25X1X and carried out repairs. [redacted] because of improper use of the machines and lack of skilled personnel handling them, the breakage rose to abnormal proportions, especially during the first three or four years of operations. Repairs were classified in four categories:

a. Routine general check in accordance with the plan

b. Upkeep and maintenance

c. Minor repairs

d. Capital repairs

Time sheet inspection charts for each piece of machinery were kept in the office of the chief engineer but were seldom considered. The complete data and time limit for the repairs and amortization of the equipment were not fixed at the plant but were established by the Technical Department of the Ministry of Heavy Machinery. These rules were standard for all installations of heavy machinery construction in the USSR.

Press Shop

3. The following equipment was to be found in the press shop of the NKMZ at Kramatorsk:

a. A steam-hydraulic forging press with a maximum capacity of 10,000

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Auth.: HR 70-2
Date: 24-7-78

tons. The press is vertical with four posts and was constructed in Germany by the firm Hydraulics in the 1930s. Its performance is satisfactory. When last seen [redacted] the press was in good working condition.

25X1X

b. A steam-hydraulic forging press with a maximum capacity of 3,000 tons. The press is vertical with four pillars and was constructed in Germany by Schloemann in the 1930s. Its performance is good. [redacted] 25X1A
25X1A [redacted] it was in good working condition.

c. A steam-hydraulic forging press with a maximum capacity of 1,500 tons. It was constructed in Germany by Schloemann. The press, [redacted] 25X1X
25X1X [redacted] was in good working condition.

d. A horizontal steam-hydraulic press with a maximum capacity of 3,000 tons. It was constructed by Schloemann in Germany.

4. The presses were serviced by overhead bridge cranes. The overhead bridge crane over a ten thousand-ton press had a freight load capacity of
25X1X 200-250 tons. [redacted] does not remember the name of the firm supplying the cranes. Forging was serviced by suspension tilting cranes. Cutting of sample metal was done by two Heller saws, each with a disk of 1,800-2,000 mm
25X1X maximum diameter. [redacted] does not remember whether the annealing furnaces worked on gas or oil. The rest of the equipment in this shop was routine and of no special interest.

Forging and Extrusion Shop

5. The following equipment was in the forging and extrusion shop of the NKMZ:

a. One steam-hydraulic press with a maximum capacity of 300 tons. It was constructed in Germany by EUMUCO.

b. Two steam-hydraulic presses with a maximum capacity of 600 tons each.

c. One steam-hydraulic press with a maximum capacity of 300 tons.

d. About 15 pneumatic forging hammers with the weight of the head ranging from 0.05 ton to 3 tons each. These hammers were supplied by the German firm EUMUCO. Two or three more hammers were supplied by a British firm, [redacted] There were 25X1X also two or three more hammers produced by the Old Kramatorski Plant (SKMZ) which were similar to the British pattern. The bridge cranes operating at the shop had been constructed at the SKMZ and the NKMZ.

Casting Shops

6. At the NKMZ there were two shops for casting iron, numbered Shop #1 and Shop # 2. Both shops had bridge cranes with a load capacity of 50 tons each.

a. Shop # 1 of heavy and medium casting had two or three cupola furnaces with a capacity of 10 tons each. The furnaces were equipped with receivers (khranilishche).

b. Shop # 2 of light and medium casting had two or three cupola furnaces with a maximum capacity of 5-7 tons each, producing each 5-7 tons of liquid cast iron per hour.

Molding Shop

7. The molding section of the NKMZ was mechanized. Molding was done by hand, using pneumatic instruments, rammers, and hammers. The shop had modern equipment, constructed in the 1930s. Sand slingers were automatic and trains bringing sand to the shop were unloaded by mechanical devices. With the
25X1X exception of cupola furnaces and cranes, the equipment of this shop was imported. [redacted] cannot identify the countries supplying the equipment, but states that according to his calculations the equipment should still be in good working condition in 1950.

Steel Casting and Trimming Shop

8. The steel casting and trimming shop of the NKMZ had three or five open hearth furnaces with a capacity of 30-60 tons each and bridge cranes with a load capacity up to 75 tons each, constructed at the NKMZ and the [illegible]. Trimming was done by mechanical and gas means; compressed air was also used.

Mechanical Shops, general information

9. Most of the metal-cutting mills were imported. The lathes were constructed by well-known foreign firms which supplied the NKMZ with their latest 25X1X production. [redacted] a small number of machine tools had been produced at the Soviet machine tool plant Krasni Proletari and had proved unsatisfactory. According to shop's foreman, the Soviet-made tools were well constructed but the material of which they were made was of poor quality and the tools broke shortly after use.

Supply of Machine Tools

10. The principal suppliers of machine tools to the NKMZ were the following:

a. Scheiss-Defries, a German firm supplying planing mills, vertical boring and turning lathes, gear-milling machinery.

b. Wagner, a German firm, supplying boring machinery, revolving and screw-cutting lathes.

c. Heinecke, a German firm supplying all types of milling machinery including gear-cutting lathes.

d. Kraven, a British firm supplying heavy cutting lathes and high-power lathes for the stripping shop.

e. Lorenz, a US firm supplying gear-cutting machines.

f. Farell (or Sykes-Farell?), supplying gear-cutting machines.

11. Only one of the deliveries made by Lorenz was unsatisfactory. Another delivery was that of a unique piece of machinery never surpassed in quality or performance by any other gear planer ever [redacted] This gear 25X1A planer was made for helical gearing without any groove and for straight-tooth gears.

Large Mills

12. There were several large mills (machines?) at the NKMZ which were essential to the plant's production. The administration of the plant, rather than let the mills be idle, frequently put them to tasks other than those for which they were originally designed. Handled by unskilled workers, the expensive tools broke after a short operation. The damage was especially disastrous as these mills were expensive and capable of producing large and essential parts with the necessary precision. The following mills worked on the production of gun barrels for naval and coastal artillery:

a. A vertical boring and turning lathe with an approximate bed length of 10,000 mm. It was constructed by Scheiss-Defries.

b. Planing lathe with the bed about 2,500 x 6,000 mm or perhaps larger, constructed by Scheiss-Defries.

c. Planing machine, with bed about 2,000 mm x 8,000 mm, constructed by Wagner.

d. Gear planer, for gear cutting, with a diameter up to 8,000 mm, constructed by the US firm of Farell or Sykes-Farell.

e. A gear-cutting machine for cross-cutting of gear, with a diameter up to 6,000 mm. Source believes that there were two mills of that type, constructed by Scheiss-Defries.

f. Cutting lathes, several, [redacted] with the 25X1X distance between centers 26 meters (centimeters?), built by Kraven, a British firm.

13. Another large forge press was acquired in Germany and brought to the NKMZ in 1934. It was the first press of that size to be received at the plant, and perhaps in the USSR as a whole. The press was so large that foundation pits 10 m deep had to be dug for its installation. A special shop housing it was planned, but the project was never carried out. The giant press was left in the open for four years, until 1938, when it was shipped to Mariupol in the Ukraine, where it was reassembled and put into operation. The press was a steam-hydraulic forge press produced in Germany by Schloemann. The capacity of this press was 15,000 tons, the weight about 3,600 tons. The two jaws of the lower transverse of the press were made of cast steel weighing about 126 tons each. The length of the posts was 25 meters, with an external diameter of 1,100 mm. The length of the bed was 10 meters and the width was three meters. The distance between gear centers was 6.5 m x 3.8 m (sic). An overhead bridge crane with a load capacity of 300-350 tons 25X1X serviced this press. [redacted] believes that this crane was supplied by the Czechoslovak firm Skoda. [redacted] the same 25X1X firm supplied the NKMZ with other cranes, in particular a bridge crane with a load capacity of 40 tons which is stationed in mechanical shop # 2. The cranes were well constructed and gave an excellent performance.

Shop of Metal Construction

14. This was one of the largest shops in the NKMZ. The equipment was excellent and the shop could actually produce any metal structures required. Only the cutting and bending of sheet metal was limited by the size and capacity of shears available at the plant. The largest shears at the NKMZ were made by the German firm REIS (sic). They allowed the cutting of sheet metal of a thickness up to a maximum of 36 mm at a width of up to 3,000 mm and at a cutting pressure up to 75 kg to a square meter. [redacted] these 25X1X rough estimates can also be applied to the capacity of the bending machine.

15. Although the shop was exceptionally well equipped, it had no facilities for automatic gas cutting and automatic electric welding. [redacted] 25X1X during the first years of World War II, there were no installations of the type mentioned in any of the plants in the USSR. Regardless of the fact that the maximum thickness of the sheet metal which could be cut or bent was limited by available tools, the shop produced metal structures by using gas in cutting. In most structures produced by this shop bending was not required. The shop produced bodies for tanks with a thickness of the plate of over 36 mm. This shop was one of the first to open production, supplying most of the metal structures for the NKMZ, including metal parts for the many hoisting and hauling installations at the plant.

Transportation

16. The NKMZ had its own intra-plant railroad of a gauge normal in the USSR (wide). It also had its own railroad depot, transport shop, locomotives, freight cars, and complete rolling stock. Trains could be brought from the outside to any of the shops. This elaborate system did not function as well as it could have. There was a shortage of auxiliary hauling and hoisting equipment; the shops had no telpher lines or cantilever cranes; there was a general shortage of electric and mechanically operated trolleys and motor cars for the intra-plant system of communications; the storage capacities of the plant were badly organized; the hoisting and hauling equipment was overloaded with work; and the cost of maintaining the transport rose abnormally high. Work was frequently delayed and at times operations had to stop while the tangle was straightened out.

Compressor Station

17. The compressor station was housed in the same building with the shop of metal construction. Here there were two rotary compressors supplied by the German firm DEMAG. All other shops using compressed air had their own 25X1X compressors. [redacted] besides rotary compressors, some of the shops had motor-driven compressors. The maximum monometric pressure was six atmospheres. In the network and in the outlets the pressure fluctuated, falling at times to 2 or 2.5 atmospheres.

Power Supply and Fuel used at the NKMZ

18. Electricity was used by the NKMZ as a principal source of power. It was supplied from two sources: the electric network (ring) DONENERGO and the turbine-operated steam power and heating plant at the NKMZ which had a production capacity of 40,000 kw. The current at this plant was three-phase alternating. The voltage in the DONENERGO ring was 110,000 v. The power plant had a central transformer sub-station which relayed current to other sub-stations servicing groups of shops. [redacted] the 25X1X central transformer sub-station converted the 6.3 kv current to 380 and/or 220 v. The motors of mills in the plant operated on a three-phase current of 380 v.

19. The steam power shop supplied the NKMZ with steam.

20. The gas generating station, working on coal, supplied gas to the plant. There was also an oxygen plant. Coke and coal were obtained from various installations in the Don Basin, while oil, gasoline, and other oil products were received from a petroleum combine, [redacted] 25X1X
25X1X [redacted] believes to have been Neftsyndikat.

Raw Material

21. The raw material for the NKMZ is mostly domestic. It is received in the form of rolled steel, pig iron billets, steel scrap, and coke. The NKMZ uses motors and generators produced at other Soviet plants, pumps from the Gorlovsk Plant in Gorlovka, and bearings from German, Swedish, and U.S. firms, such as Timkens and SKF.