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CENTRAL INTELLIGENCE AGENCY
WASHINGTON, D.C. 20505

MICRO ONLY

CIA/ER/77-10466--M

26 July 1977

MICROFILMED

MEMORANDUM FOR: Mr. William Root
Director
Office of East-West Trade
Department of State

SUBJECT : Numerically Controlled Machine
Tools in Communist Countries

REFERENCE : Memorandum to N [redacted]
dated 8 July 1977

1. Attached is a discussion of Soviet and East European capability to produce large numerically controlled machine tools with characteristics exceeding embargo limits specified in 1091(b).

2. The data were prepared by [redacted]
If you have further questions, he may be reached on 351(IDS-143)-6901.

[redacted]

Office of Economic Research

Attachment:
as stated.

[redacted]

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5

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Production of Large Numerically Controlled
Machine Tools in Communist Countries

The USSR and East Germany have produced numerically controlled (NC) machine tools with a slide travel distance exceeding the 3,000 mm limitation under 1091(b). We have no information that the other Communist countries -- Bulgaria, Czechoslovakia, Hungary, Poland, and Romania -- have produced numerically controlled machine tools in this size range.

Production data on Soviet and East German large numerically controlled machine tools are not available. Nevertheless, output is believed to be small. Briefly, we have identified dozens of models of numerically controlled milling, drilling, and boring machines produced by the Soviet machine tool industry, but only three have exceeded the IL 1091(b) size limitations (see Table). Of these three models, only one is reported to be in production; the other two models may be in prototype. In addition, we have identified two East German NC machine tools in this size range; we do not know if more than one of each of these has been produced.

In the USSR, in addition to the machine tool industry proper, the Ministry of the Aviation Industry also produces numerically controlled machine tools for use in aircraft manufacturing. We have identified six models of

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large NC machine tools produced by this Ministry which exceed IL 1091(b) size limitations (see Table). Again, we do not know how many large NC machine tools have been produced by the Aviation Ministry, but believe output has been small.

In general, the overall quality of large Soviet machine tools (both standard and numerically controlled) does not measure up to Western standards. For example, nearly all large Soviet boring mills have slides with high coefficients of friction (.05-.08). This means slide surfaces wear down rapidly resulting in an early loss of accuracy. Also, Soviet machines are not equipped with high-torque motors with the broad range of rotating frequencies required for efficient use in heavy machine tools. The Soviets have been attempting to produce high-torque motors for large machine tools but results, to date, have been unsatisfactory. In the current 5-Year Plan (1976-80), the Soviets have planned for the production of hydrostatic slides (to reduce friction), and improve quality high-torque motors for installation on large machine tools. We do not know if this program is being successfully carried out, or, indeed, if it is being carried out at all.

CIA/OER
26 Jul 77

-2-

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Table

USSR and East Germany: Models of NC Machine Tools Exceeding IL 1091(b) Limits

Type	Model No.	Travel/Table Size (mm)	Horsepower	Manufacturer	Date of Info
(Produced by Machine Tool Industry)					
Plano-miller	6M610F3	3,650	40	Minsk Machine Tool Plant Imeni October Revolution	1974-Prototype 1977-In prod.
Milling, drilling boring machine with revolving head	1S453F2	3,000 x 3,200	--	Ordzhonikidze	1974
Milling and boring mill with Gantry (for turbine mfg.)	NS33F2	15,450 (Gantry)	100	Novosibirsk Heavy Machine Plant Imeni Yefremov	1977
(Produced by Aviation Industry)					
Vertical milling machine	FP-7M	3,000 x 500	30	Ministry Aviation	1973
Vertical milling machine	FP-37	3,000 x 800	40	Ministry Aviation	1973
Plano-miller with Gantry	PPP-5D	X-20,000 Y- 1,600 Z- 325	27	Ministry Aviation	1973
Plano-miller	FP-11	5,000 x 16,000	26	Ministry Aviation	1973

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Table

USSR and East Germany: Models of NC Machine Tools Exceeding IL 1091(b) Limits
(continued)

Type	Model No.	Travel/Table Size (mm)	Horsepower	Manufacturer	Date of Info
USSR (continued)					
(Produced by Aviation Industry)					
Plano-miller	FP-9M	7,000 x 1,600	27	Ministry Aviation	1973
Milling machine	RFP-4	4,500 Gantry 1,700 Cross carriage 400 Vertical carriage	5	Ministry Aviation	1973
Machining center	C-FZ 1600	7,000 x 1,600	43	VEB Werkzeugmaschinenfabrik Aschersleben	1975
Milling machine (dual spindle)	--	X-12,000 Y- 4,000 Z- 3,150	2 (95)	Fritz Heckert	1977

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East Germany