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## Economic Intelligence Report

# HEAVY DEMANDS ON SOVIET MACHINE BUILDING IN 1962



CIA/RR ER 63-30

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## Economic Intelligence Report

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## HEAVY DEMANDS ON SOVIET MACHINE BUILDING IN 1962\*

"In many branches of our industry there is not sufficient capacity or supply of machines and equipment to assure the uninterrupted planned growth of a particular project." Kozlov, 27 February 1963.

"Of course, had the international situation been better, had it been possible to achieve agreement and to shake off the burden of armaments, that would have multiplied the possibilities for a further improvement of the economy ... ." Khrushchev, 27 February 1963.

### Summary and Conclusions

The Soviet machine building industry is required simultaneously

- (1) to increase the supply of producers machinery\*\* to the economy and
- (2) to meet the needs of the expanding Soviet military and space programs. The diversion of labor, materials, and producers machinery in support of the latter has weakened somewhat the present ability of the machine building industry to support the growth of the economy. This weakening is reflected in the reduction of the growth rate of output of producers machinery from an annual average of almost 15 percent during 1956 through 1958 to about 9 percent during 1959 through 1962. The estimated growth rate of output of all types of machinery (including military) rose from 8 percent to 11 percent in the respective time periods. In 1962 the total increase in production of machinery is estimated to have been 11 percent, including an increase in producers machinery\*\*\* of 9 percent and an increase in military machinery† of 14 percent.

\* The estimates and conclusions in this report represent the best judgment of this Office as of 1 July 1963.

\*\* The term producers machinery as used in this report includes all durable machinery and equipment employed in the processes of mining, agriculture, manufacturing, transportation, and communications. Buildings and structures as such are excluded. Durable military goods are excluded with the exception of some types of machinery that may be utilized for either civilian or military purposes -- such as trucks and communications equipment. All types of machinery for which production figures are published in Soviet plan fulfillments are to be classified as producers machinery.

\*\*\* This report will utilize an index produced by this Office and labeled "index of civilian machinery," but which is not adjusted to exclude military procurement of such producers machinery as trucks and communications equipment and thus is synonymous with "producers machinery" as used herein.

† The term military machinery as used in this report includes all machinery and durable equipment purchased [footnote continued on p. 2]

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In spite of failure to meet production goals in several lines of producers machinery, there were, nevertheless, some important gains during 1962, especially in lines that were recently granted increased priority in the allocation of capital resources. The value of output of agricultural machinery rose 21 percent, with particularly high growth rates for corn and beet combines. Output of instruments increased more than 15 percent and additional models of transistorized electronic computers and industrial control equipment were placed into production, thus effecting noteworthy gains in quality as well as quantity. Output of metalcutting machine tools rose 6 percent to 176,000 units, more than four times the number produced yearly in the US -- a growth trend that has been in evidence for several years.

Although the planned growth rate of production of chemical equipment was 18 percent, there was an actual increase in production of only 9 percent during 1962. In many instances the quality of chemical equipment was poor and the development of new models behind schedule. The failure of the chemical equipment industry to meet planned goals is of great concern to the Soviet leaders, because substantial increases in imports of equipment will be needed to meet chemical production targets of the Seven Year Plan. An underfulfillment of the plan for production of rolling mill equipment and problems in producing equipment of the desired quality and productivity helped to aggravate the shortage of large-diameter pipe for oil and gas transport.

Output of motor vehicles increased 4 percent and tractors 9 percent; neither achieved the annual growth rate necessary to fulfill production targets for 1965. These industries are revamping production relationships so that specialized engine and components plants will supply major assembly plants, somewhat disrupting the present rate of production but also increasing the possibility of higher rates of production within 1 or 2 years.

In spite of the underfulfillment during both 1961 and 1962 in production of major lines of producers machinery, the 1962 plan for capital expenditure for producers machinery\* was fulfilled, demonstrating a

by the military, as estimated on the basis of costing military missions and tables of organization. Insofar as military procurement of such items as trucks and communications equipment is included, these items being recorded in statistics on producers machinery, there is a slight overlap with the preceding category of producers machinery.

\* The term capital expenditure for producers machinery as used in this report includes all expenditures for machinery and equipment made on capital account and identifies a use made of the output of producers machinery. Because Soviet statistics on capital investment include some expenditures for capital investment [footnote continued on p. 3]

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10-percent increase, compared with the 9-percent increase in domestic production of producers machinery during 1962. In part, the meeting of this goal for machinery purchases was made possible by an increase in imports. The 1963 plan for capital expenditure for producers machinery calls for a 16-percent increase above the 1962 level and is unlikely to be met unless more resources are allocated to production of civilian machinery than would now seem to be intended or unless imports of machinery can be increased enough to fill the gap likely to be left unfilled by domestic production.

Plans were formulated during 1962 to run machine building plants two or three shifts rather than one or two. Some progress in adding shifts at plants producing major types of machine building may be expected during the next 3 years in selected major cities. Gains in output will be limited by problems associated with (1) recruiting the necessary labor force, (2) obtaining worker cooperation, (3) eliminating bottlenecks imposed by certain scarce types of equipment already being used at full capacity, and (4) assuring the necessary supply of basic materials (especially castings). Because of the importance of overcoming present deficiencies in the supply of various types of chemical equipment, particular emphasis has been given to running chemical equipment plants on two or more shifts.

During 1962, capital investment in the machine building industry rose 8 percent over the 1961 level of expenditure, although the plan called for a 14-percent increase. The plan for 1963 calls for only a 6-percent increase. In spite of the nonfulfillment in 1962 of production targets for several major lines of equipment, as discussed below, Soviet planners at the end of 1962 accepted a reduction in the pace of capital expansion in the machine building industry (although not in all product lines). Instead, the planners appear to place even greater reliance than in 1962 on measures to develop more intensive use of existing capacity in order to meet the 1963 production targets. Although some gains during 1963 may result from efforts to increase the number of shifts worked at plants and to increase the specialization and concentration of production, Soviet performance in 1962 does not justify an assumption that large gains in production will result immediately from such measures.

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made by the military establishment, consisting of the procurement of durable equipment for installation at fixed military facilities, this use category falls short by an estimated 5 to 10 percent of being completely civilian.

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## I. Introduction

Soviet machine building, which in 1962 provided larger quantities of machinery in support of ambitious plans for economic development\* and continued the expansion of output of military hardware begun in 1959, is the largest and the fastest growing branch of Soviet industry. It employs 32 percent of the industrial labor force and 20 percent of the fixed capital used in industrial production and provides 22 percent\*\* of gross industrial output. 1/\*\*\* During the 7 years from 1956 through 1962, its average annual growth of output was almost 10 percent, as measured by the machinery index of this Office, or almost 15 percent as measured by Soviet indexes. 2/

The full Soviet designation of this branch of industry is "machine building and metalworking." It comprises a vast grouping of industrial activities including production of industrial machinery, electrical machinery, transportation equipment, instruments, ordnance, military shipping and aircraft, many types of fabricated metal products, and consumer durable goods as well as the repair of these products. The end products of the industry directly support the ability of the USSR to wage war, to maintain growth of the economy, to support foreign economic assistance, and to satisfy the desire of the Soviet consumer for a new washing machine or television set.

## II. Lag in Growth Rate of Producers Machinery Compared with Total Output of Machinery

Production trends in Soviet machine building during 1962 -- not sharply different from those of 1961 -- continued to reflect the change of emphasis that began in 1959, at which time the growth rate for producers machinery in aggregate dropped while the estimated growth rate for military machinery rose sharply above the rate of the preceding 3 years.† During 1956 through 1958, before increased emphasis was

\* For a brief chronology of the more important recent events and statements of policy directly affecting Soviet machine building, see Appendix A.

\*\* Data are for 1960 but would be in approximately the same proportions in 1962.

\*\*\* For serially numbered source references, see Appendix B.

† The official Soviet claim was that the index for production of "machine building and metalworking" rose 15 percent in 1962, a performance comparable with average annual growth during the last decade. Outside the USSR, students of the Soviet economy have raised many questions about the reliability of the official Soviet index for machine building in view of the methods followed [footnote continued on p. 6]

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assigned to military output, the index of producers machinery rose by an average of 15 percent per year, and during 1959 through 1962 the average fell to 9 percent.\* During 1962, total Soviet machinery production -- military and producers -- rose by an estimated 11 percent, a figure comparable to the average rate of growth during 1959 through 1961, but the index for producers machinery rose only 9 percent whereas the index for military machinery rose an estimated 14 percent. 3/

At year-end 1962, plan overfulfillment was claimed for the production of several types of producers machinery, including agricultural machinery, instrumentation and equipment for automation, and machine tools. Production targets were not met for several major categories, however, including chemical equipment, petroleum refining equipment, rolling mills, turbines, motor vehicles, and tractors.

Output of electric power equipment continued to expand rapidly during 1962 in strong support of efforts to improve power supply and to further the mechanization of the economy. Production increased as follows: generators, 16 percent; turbines, 11 percent; transformers, 19 percent; and electric motors, 13 percent.\*\* Generally, these increases were comparable with rates achieved during the last 7 years. Continuation of such growth (which is expected) should permit attainment of the 1965 targets originally published. The trend toward production of large-capacity steam turbines and turbogenerators continued in 1962 as follows:

	<u>Units Produced</u>	
	<u>1961</u>	<u>1962</u>
Steam turbines		
300-megawatt	0	2
200-megawatt	8	13
Turbogenerators		
300-megawatt	1	2
200-megawatt	8	13

by Soviet statisticians in computing it and the gaps in the published data that prevent others from reconstructing it. Therefore, this Office has constructed its own index of Soviet machinery production on the basis of announced statistics on the production of commodities, intelligence estimates of production, and methodologies more comparable with those followed in the US.

\* See Table 1, which follows on p. 7.

\*\* See Table 2, which follows on p. 8.

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Substantial progress was made in the preparation for production of both turbines and turbogenerators of 500-megawatt capacity. Production began in 1962 on hydrogenerators and hydraulic turbines of this capacity for the Krasnoyarsk Hydroelectric Powerplant; first delivery is not scheduled, however, until 1964.

Table 1  
Growth in Total Output  
of Machinery, Producers Machinery, and Military Machinery  
in the USSR <sup>a/</sup>  
1956-62  
Percent of Increase over Previous Year.

<u>Year</u>	<u>Total Output of Machinery</u>	<u>Producers Machinery</u>	<u>Military Machinery</u>
1956	8	18	-2
1957	8	15	-1
1958	9	12	4
1959	13	10	16
1960	9	9	8
1961	11	9	14
1962	11	9	14

a. Figures for 1956-61 are revised estimates of this Office <sup>4/</sup>; 1962 estimates are based on plan fulfillment data and commodity production estimates.

Under the pressure of agricultural problems, a state decree in March 1962 directed that additional resources be allocated to the production of agricultural machinery.\* Virtually every plant in the industry is being expanded or reconstructed. In addition, during the course of 1962 a number of plants were converted from other uses to the production of agricultural machinery. According to the decree, two new plants are to be built. In consequence of measures already taken, there has been a strong improvement in the output of agricultural machinery. Output rose 21 percent over the preceding year and was 3 percent higher than the initial plan for the year. The highest rates of increase were for the production of combines, especially for corn and beets.

The production of instruments grew by 15 percent during 1962, a modest overfulfillment of the production plan. The output of such

\* Tractors are a separate category (see p. 11, below).

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Table 2

Growth in Output of Selected Producers Machinery in the USSR a/  
Selected Years, 1955-62, and Original 1965 Plan

Type b/	Percent of Increase over Previous Year		Unit of Measure	Output			
	1962	Average Annual 1956-61		1955	1961	1962	Original 1965 Plan
Agricultural machinery	21.2	10.1	Million new rubles	540	964	1,168	1,587.0
Transformers	18.6	21.7	Million kilovolt-amperes	19.7	64.1	76.0	89.1
Turbogenerators	16.4	13.0	Million kilowatts	4.5	9.4	11.0	17.5 to 18.4
Merchant ships	15.7	12.6	Million 1960 US \$ c/	269	548	634	N.A.
Instruments	15.4	N.A.	Million new rubles	N.A.	1,321	1,525	1,850 to 1,920
Petroleum refining equipment	13.3	13.9	Thousand metric tons	48.8	106.8	121.0	N.A.
Metallurgical equipment	12.7	3.7	Thousand metric tons	172.1	213.9	241.0	N.A.
Electric motors (AC)	12.6	16.8	Million kilowatts	8.8	22.3	25.1	32 to 34
Commercial communications equipment	11.1	13.0	Million new rubles	130	270	300	700 c/
Turbines	11.1	11.6	Million kilowatts	5.6	10.7	11.9	18.7 to 20.4
Locomotives, main-line electric	10.8	19.2	Units	194	557	617	N.A.
Chemical equipment	9.4	21.1	Million new rubles	76.1	240.5	263	350 to 370
Tractors	8.9	8.3	Thousand units	163.4	263.6	287.0	450.0 d/
Metalforming machine tools	8.2	10.1	Thousand units	17.1	30.5	33.0	36.2
Excavators	6.8	20.4	Thousand units	5.2	16.0	17.1	24.4 d/
Metalcutting machine tools	6.2	6.0	Thousand units	117.1	165.8	176.0	190 to 200
Motor vehicles	4.1	3.7	Thousand units	445.3	555.3	578.0	750 to 856
Locomotives, main-line diesel	1.9	48.8	Sections	134	1,455	1,483	N.A.
Civil aircraft	-7.6	24.9	Million new rubles	59	224	207	N.A.

a. Based on plan fulfillment information, intelligence estimates (for civil aircraft and merchant ships), Seven Year Plan data, and source 5/.

b. Listed in order of magnitude of the 1962 growth rate.

c. Estimated.

d. Revised figure.

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products as electrical measuring instruments, process control equipment, and computers was stimulated by a rapid rise in civilian and military demand. Overfulfillment of the 1962 production plan was made possible by a supplementary allocation of investment resources added to the 1962 investment plan by state decree in December 1961. Some enlargement of capacity has been necessary in this industry to continue the rapid growth of production; most of the major plants are working two shifts and at high levels of production relative to capacity. During 1962 a major advance in the quality of product occurred with the introduction of a number of transistorized models of electronic computers and industrial control equipment.

The production of machine tools overfulfilled the plan and continued to grow at a rate comparable to that of the recent past. The output of metalforming machine tools, to which growing attention is being paid, increased 8 percent. The increase of 6 percent in production of metalcutting machine tools brought total 1962 production to 176,000, compared with about 40,000 produced in the US. The Soviet park of metalcutting machine tools was 2.4 million in April 1962; the US park is currently estimated to number approximately 2.1 million.

In the Soviet production mix, special-purpose and precision metalcutting machine tools continue to be given priority. The silence of Soviet journals about output of automatic lines may indicate that production in 1962, as in 1961, did not meet the plan. In addition, many complaints about the reliability of new lines were noted.

Many important lines of equipment made a poor showing during 1962, either not fulfilling the production plan or achieving a lower rate of growth than the average during the preceding 6 years. Of the deficient lines, the most important failures were registered in production of chemical equipment and rolling mills.

The increase in production of chemical equipment was only 9 percent instead of the planned 18 percent, following the substantial underfulfillment in 1961. Shortfalls were extensive in many lines of equipment, and shortages of supply have been noted for corrosion-resistant vessels, tire vulcanization equipment, compressors, separators, plastics extrusion equipment, mixers, and equipment for spinning fibers. Chemical plants frequently complained during 1962 that much newly received equipment was defective and required costly repairs. For reasons not yet apparent, during 1962 capital resources allocated to the construction of chemical equipment plants were partly diverted, while at the same time modernization of many major facilities fell behind schedule. The increase in output of 9 percent was markedly lower than the annual average of 21 percent achieved during 1956 through 1961. Nevertheless, it is still considered possible that the

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1965 production target for a value of output of 350 million to 370 million rubles\* may be achieved, but total deliveries of equipment during 1959-65 probably will be less than called for under the Seven Year Plan. Further, plans for production of many types of equipment required in processes for the manufacture of fertilizer, synthetic materials, and petrochemicals are not likely to be fulfilled. The USSR will remain in the market for imports of chemical equipment from Free World countries.

Although the USSR produced 241,000 metric tons\*\* of metallurgical equipment during 1962 (13 percent more than the preceding year), it is believed that this amount fell far short of the plan. Production of rolling mill equipment, usually some 50 to 60 percent of the total tonnage output of metallurgical equipment, was also underfulfilled. In 1961, only 102,000 tons of rolling mill equipment were built, compared with the plan of 150,000 tons for that year. It is estimated that production of rolling mill equipment in 1962 was less than 150,000 tons -- that is, less than the amount called for in the 1961 plan.\*\*\* Although important new facilities for manufacturing rolling mill equipment have been installed at the Uralmash Plant, new construction at the Alma-Ata Heavy Machine Building Plant has been lagging, and no new construction has been noted at the Elektrostal' Plant, which is to manufacture most of the new Soviet pipe mills, according to the planning for 1959-65.

As has been well publicized, the USSR has continued to encounter problems in the domestic production of large-diameter pipe mills to produce pipe for oil and gas transport. The first 1,020-millimeter pipe-welding mill was built and installed at the Novo Moskovsk Tube Works late in 1961, but equipment defects and other problems were reported to have caused lengthy delays in obtaining designed levels of output and efficiency. During 1962, work was rushed on new facilities but was not completed. Work is continuing on these additional mills, some of which are being adapted from existing facilities that produce smaller diameter pipe. Present plans call for these additional lines to be in operation by the end of 1963 at the Chelyabinsk Tube

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\* Ruble values in this report are given in new rubles established by the Soviet currency reform of 1 January 1961. A nominal rate of exchange based on the gold content of the respective currencies is 0.90 ruble to US \$1. This rate, however, should not be interpreted as an estimate of the equivalent dollar value of machinery produced in the US.

\*\* Tonnages are given in metric tons throughout this report.

\*\*\* The total increase in production of all types of metallurgical equipment was only 20,000 tons during 1962. If all of the increase was in the form of rolling mill equipment, output of this product would have been 130,000 tons in 1962.

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Mill, the Il'yich Steel Plant at Zhdanov, and the Khartsyzsk Tube Plant.

Another major problem in production of metallurgical equipment is the delay encountered in developing and setting up production of oxygen converters, although in 1962 two 100-ton converters were manufactured at the South Ural Heavy Machine Building Plant.

Production of petroleum refining equipment increased 13 percent rather than the planned 15 percent. Total production during 1962, however, was 121,000 tons, or 70 percent greater than production in 1958. Thus, although output probably is not adequate to meet present requirements for refinery equipment, the availability of refining equipment has increased significantly during 1959-62. Soviet efforts to obtain modern refinery equipment from the Free World have been particularly directed toward types of equipment for processes not yet in wide use in the USSR, such as catalytic reforming of gasoline, hydrofining, and the production of additives and various catalysts.

During recent years (1956 through 1962) the production of motor vehicles has increased gradually by an average of 3 to 4 percent per year, and 1962 was no exception. Continuation of this modest growth rate would not permit attainment of the original 1965 goal for the production of about 750,000 to 856,000 motor vehicles of all types. During 1962, however, four major plants were being enlarged, and plans were virtually completed for beginning the enlargement of a fifth. A significant potential for enlarged output is being developed, with results likely to be evident within a year or two. In addition, the USSR during the course of 1962 organized several plants as specialized parts producers. In this sense, 1962 was a transitional year during which the previous form of production, that of vertically integrated automotive plants, was being altered into another form more similar to that of the US industry, with assembly plants being supplied by specialized components plants.\* During this transition the serial production of new models originally scheduled for 1962 was postponed for 6 months to a year, but following the transition a significant increase in production may be expected.

A similar transition in the nature of production is underway in the tractor industry. As a result, the 9-percent growth in output during 1962 was low in comparison with the growth rate necessary to achieve the present 1965 target of 450,000 tractors, but the rate is expected to increase once the transition period is completed in a year or two. During 1962, development work continued preliminary to the production

\* The impact of this transition in delaying the introduction of new models was more marked in 1962 than in the 2 preceding years.

of large wheeled tractors in the 130- to 300-horsepower range. Every plant in the industry was in the process of expansion or modification. The new Kishinev Tractor Assembly Plant began production of a light tractor in 1962. Several plants were converted to specialized production of parts or components, and some plants began to abandon former lines of production. Problems developed during the year as plants under expansion failed to receive equipment on schedule, interfering with their own production schedules.

In statistics currently published on Soviet machine building, there is a large hiatus covering the activities of those enterprises producing military machinery. It is estimated by this Office, however, that the production of military hardware rose at a more rapid pace than output of producers machinery during 1959 through 1962\* and that this was a departure from the relationships existing during 1955 through 1958. The relative performance in the production of producers machinery was not any worse in 1962 than in 1961, but the production of military items during 1962 continued to grow more rapidly than production of producers machinery.

In spite of the underfulfillment during both 1961 and 1962 in the production of major lines of producers machinery, the 1962 plan for capital expenditure for producers machinery was announced as being fulfilled. Real expenditures for producers machinery increased 10 percent in comparison with an estimated 9-percent increase in domestic production of such machinery during 1962. In part, the meeting of the capital investment goal for machinery purchase was made possible by an increase in the import of machinery. The 1963 plan for capital expenditure for producers machinery calls for a 16-percent increase over the level in 1962 and is unlikely to be met unless more resources are allocated to production of producers machinery than would now seem to be intended or unless imports of such machinery during 1963 can be increased enough to fill the gap likely to be left unfilled by domestic production.

### III. Contribution of Imports

During 1959 through 1962, when the domestic production of producers machinery was growing less rapidly than during 1956 through 1958, Soviet imports of such machinery increased until in 1962 the level was more than 80 percent greater than in 1958 (see Table 3\*\*). The picture was quite different for exports. Although Soviet exports of machinery expanded almost 80 percent during 1958 and 1959, total exports declined 17 percent during 1960 and 1961. During the latter period the sharp

\* See Table 1, p. 7, above.

\*\* Table 3 follows on p. 13.

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reduction in exports of machinery to Communist China was partly made up by an increase in exports to non-Bloc underdeveloped countries and to the European Satellites. It is estimated on the basis of preliminary data that during 1962 Soviet exports of machinery rose as much as 10 percent above the 1961 level.

Table 3

Net Imports of Producers Machinery in the USSR a/  
1955-62

Million New Rubles			
<u>Year</u>	<u>Imports</u>	<u>Exports</u>	<u>Net Import Balance</u>
1955	833	539	294
1956	806	562	244
1957	847	587	260
1958	958	715	243
1959	1,217	1,051	166
1960	1,508	1,027	481
1961	1,565	868	697
1962 <u>b/</u>	1,750	950	800

a. Data are from statistical yearbooks, in current prices f.o.b. Normally, import valuations do not reflect the domestic value of imports because they are calculated according to the arbitrary official exchange rate. The bias is such that a valuation in foreign trade rubles is higher than the appropriate valuation in domestic rubles.

b. Estimated.

Although the trade returns for 1962 are not yet available in detail as to flows by commodity and by country, preliminary evidence indicates that Soviet imports from the industrial West and Japan continued at a high level as deliveries were made on contracts concluded earlier. Purchase orders concluded in 1962 are indicative of current Soviet interests and of deliveries to be expected in the near future. An increase has been noted in the purchase of equipment for the electronics industry. Fifteen hundred diesel engines were purchased from the UK for the Volga automobile. Contracts were signed for the purchase of components for five to seven chemical plants, with particular interest evidenced for Western equipment for the production of plastics, manmade fibers, and fertilizers. Negotiations were concluded with an Austrian firm for the purchase of an oxygen converter installation for

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the steel industry. Purchases of fishing boats and equipment for food and light industry have been extensive. From the European Satellites the USSR continued to receive extensive shipments of machine tools, transportation equipment, and electrical machinery.

The trend during 1960 through 1962 has been for imports of machinery to increase relative to exports, but there is some prospect that this trend will be interrupted, perhaps as early as 1963. In support of trade and aid commitments made following 1960, Soviet exports of producers machinery -- especially to the European Satellites -- may grow more rapidly during 1963 through 1965 than during 1960 through 1962. On the import side, in consequence of a dip in the volume of new Soviet orders of such machinery from the Free World that occurred during late 1961 and early 1962, growth in the volume of imports during 1963 may fall below the growth rate achieved during 1962. The volume of new orders increased once more during early 1963, however.

#### IV. Plans for Multishift Operation of Plants to Increase Output

If feasible, the addition of a shift in the operation of Soviet machine building plants would increase output and result in the more efficient use of plant and equipment. Plans to this effect are now being worked out, especially in those major urban machine building centers where the labor supply is relatively plentiful. Planning and implementation of this project did not advance sufficiently during 1962 to bear much fruit, however.

According to Soviet measurement, expressed as the inverse of the ratio of workers in the first shift to the total number of workers in all shifts, the average number of shifts worked in Soviet machine building plants was 1.4 at the beginning of 1962. In other words, 71 percent of the workers in Soviet machine building plants worked the first shift. Roughly the same ratio held in mid-1959 and, indeed, back in mid-1953.

Of the workers in the first shift, some are in shops working only one shift, others are in two-shift shops, and yet others in three-shift shops.\* Thus, in 1959, when conditions are estimated to have been the same as at the beginning of 1962, the distribution of first-shift workers was as follows\*\*:

\* In present Soviet planning, three-shift operation means three weekly shifts of 41 hours each (such as 7 hours each for 5 days and 6 hours on the sixth) and does not necessarily imply continuous around-the-clock operation.

\*\* Estimated on the basis of data in source 6/.



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Percent of Total Workers  
in Machine Building and Metalworking

Total in first shift	<u>71</u>
In one-shift shops	50
In two-shift shops	13
In three-shift shops	8

The proportion of the number of employees to the number of shifts scheduled for their shops is a useful labor force measure of the intensity of use of machine building plants. Representative of the situation at the beginning of 1962 are the following data for 1959, newly released 7:

Percent of Total Workers  
in Machine Building and Metalworking

Total employees	<u>100</u>
On a one-shift schedule	50
On a two-shift schedule	27
On a three-shift schedule	22
On a four-shift schedule	1

The need to add shifts in Soviet machine building plants was an immediate consequence of the reduction in the workweek and the accompanying reduction in the hours of utilization of equipment. This fact was brought to the attention of the 22d Party Congress by Kosygin on 21 October 1961. 8/ In May 1962, Khrushchev noted with approval the initiative of various Leningrad plants in planning to adopt two-shift and three-shift schedules. 9/ Later on in 1962, there were many press announcements that various planning officials and plant managers had begun to work out plans to add an additional shift by 1965, but there is no evidence that any large number of plants actually did put on additional shifts during 1962.

During 1962, many plants were on a two-shift basis, but most of them had been on such a basis for many years. Most tractor plant assembly lines are running two shifts, as are many of the major electronics plants. The Gor'kiy Motor Vehicle Plant is on two shifts. By late 1962, most of the machine building plants in the major manufacturing center of Gor'kiy were operating two shifts. 10/ Reportedly, the chemical equipment plants of Gor'kiy and Leningrad are running two shifts. 11/

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Many plants appear to have plans for additional shifts in various stages of development. Thus the Gor'kiy Motor Vehicle Plant has been noted as planning to put on a third shift. The Khar'kov Tractor Plant considered operating a third shift, but the management encountered a local shortage of labor. In October 1962, visitors to Leningrad, a major center planning a switchover to two-shift and three-shift operation, viewed machine building plants where there was no evidence of a campaign to increase the number of shifts, although the plants were not on a full two-shift basis. The visitors did have the impression that there were labor shortages in Leningrad. 12/ Because not long ago Leningrad had been a labor-surplus center, the existence of such shortages may indicate increased staffing of types of plants not open to visitors, such as the major electronics and military components plants located in the city.

Until Soviet plans have been worked out in greater detail and until there is some evidence as to the policies that will be followed in implementation, involving questions of scheduling, labor force movement, wage incentives, supply, and the solution of bottlenecks -- such as the fact that some types of machinery are already being used in three shifts -- any estimate of the progress to be expected is extremely provisional.

The main brunt of the program to add shifts will be borne by the major urban machine building centers, such as Moscow, Leningrad, Sverdlovsk, Gor'kiy, Penza, Orenburg, and Voronezh. 13/ These centers have the population and the supply of skilled labor essential to any implementation of the program.

Some limited progress in adding shifts may be expected during the next 3 years. Output gains will be limited, however, by problems associated with recruiting the necessary labor force; obtaining worker cooperation; eliminating bottlenecks imposed by certain scarce types of equipment already being used at full capacity; and assuring the necessary supply of basic materials, especially of castings. In the near future the greatest progress is to be expected in converting single-shift plants to two-shift operation, as this does not create as many problems of scheduling and incentives for night work as the conversion from two shifts to three shifts. Already the enthusiasm of Soviet planning for three-shift operation appears to be waning. Officials in Leningrad -- the bellwether of the movement -- have quietly abandoned the original plan to implement three-shift operation of machine building plants by 1965 and recently have been discussing a plan to implement two-shift operation. 14/

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#### V. Plant Specialization Under Central Control for Future Increases

Although technical progress in machine building is closely related to efforts to improve specialization, many large machine building enterprises in the USSR have attempted to satisfy a wide gamut of production requirements within their own shops. Even though their own production may not be the most efficient, at least they are assured that their own requirements for the items produced will be met under their own control. The Soviet system now offers only limited incentives for greater specialization in production, however desirable it may seem, and therefore Soviet officials are forced to rely on administrative methods to speed the pace. During 1962, some greater specialization of production was achieved in tractor and motor vehicle plants as a result of planned changes in production assignments.

Plans published during 1962 propose some important changes in the production assignments of tractor and motor vehicle plants. It is intended, for example, that 40 percent of the production of automotive engines in 1965 will be in specialized engine plants rather than in the large integrated auto plants, whereas in 1960 only 6 percent of the engines were so produced. 15/ A similar change is planned to occur in the tractor industry. Some steps have been taken toward implementation of these plans. During 1962, for example, the Volgograd Tractor Plant began to reduce its own production of tractor engines while receiving engines from a specialized engine plant in Khar'kov; this change was only partial, however, as the latter plant was having difficulties with its new automatic lines.\*

Although some success has been achieved in implementing changes in production assignments under close supervision from central planning authorities for selected industries, the administrative approach to specialization has not been very successful when applied to large segments of industry. Such a fate is likely for the new plan to introduce a higher degree of specialization into all of machine building as announced in July 1962 by Kostousov, Chairman of the State Committee for Automation and Machine Building.\*\* 16/

Plans for progress in specialization continue to loom large in Soviet long-term planning, but there is little basis to expect immediate gains in output. Slow progress in specialization during 1962 evoked expressions of concern from Khrushchev and other officials. 17/ In

\* For further details on progress in specialization, see II, pp. 11-12, above.

\*\* In early 1963 this state committee was stripped of much of its authority and renamed the State Committee for Machine Building, becoming one of seven state committees concerned with civilian machine building.

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the hope of speeding the pace, centralized direction will be provided by the newly formed Supreme Economic Council and other central authorities. 18/

VI. Little Stress on Capital Investment in Machine Building

The capital investment program in machine building in recent years has not gone well: in 1961 the planned increase in annual capital investment was 40 percent, but the actual increase was only 14 percent. The planned increase in 1962 was 14 percent, but the actual increase was 8 percent. The construction periods have been stretched inordinately for many plants, and shortages of equipment have taken their toll. Major plants in machine building scheduled for completion in 1961 received in that year only 40 percent of the requisite metalcutting machine tools, 31 percent of the needed forge-press equipment, and 20 percent of the materials handling equipment.\* 19/ Corresponding data for 1962 are not available, but it is unlikely that there was any marked improvement.

In recent years, more than 70 percent of the capital investment in machine building has gone into the modernization and expansion of existing plants, and of this amount an increasing share has been linked with the establishment of large-scale specialized production. For the most part, the construction of new plants has been associated with relatively new product lines requiring specialized production, such as plants for the production of chemical equipment and electronic items.

Some information has been published about the relative priorities of the subcategories of machine building in the capital investment programs of recent years. During 1961, special priority was attached to capital investment projects in new or existing plants producing equipment for the power, metallurgy, chemicals, oil, light, and food industries. 20/ During 1962, priority was attached to the same industries with the addition of agricultural equipment, tractors, instruments, and equipment for industrial automation. 21/ During 1963, priority is to be attached to various projects related to tractors, metalcutting machine tools, chemical equipment, and electronic equipment. 22/

The modest plan for capital investment in machine building during 1963, calling for only a 6-percent increase, provides testimony that the decision has been made not to soften the strains on machine building through a massive investment effort. It is to be questioned whether the alternatives -- imports, more intensive use of equipment, and improved organization of production processes and interplant relations -- will succeed in providing the requisite immediate gains in output in support of present programs stressing both military buildup and economic development.

\* The usual Soviet criterion for a "major project" is one involving an investment of more than 2.5 million rubles.

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APPENDIX A

CHRONOLOGY OF SELECTED POLICY STATEMENTS CONCERNING MACHINE BUILDING  
1961-63

<u>Date</u>	<u>Statement</u>	<u>Source</u>
21 October 1961	Kosygin delivers speech on need for multishift operation and specialization.	22d Party Congress
8 December 1961	Supreme Soviet instructs planners to speed up construction of new plants for instruments and equipment for automation.	<u>Izvestiya</u>
11 March 1962	Plenum on agriculture assigns additional resources for production of tractors and agricultural machinery.	Soviet press
March 1962	<u>Mashinostroitel'</u> editorializes on the necessity for specialization of output to obtain 1980 targets.	<u>Mashino-</u> <u>stroitel'</u>
23 March 1962	Academicians write that incentives are not encouraging the introduction of new technology properly and need revamping.	<u>Pravda</u>
6 April 1962	Plant director states that "all plants are gradually changing over to two-shift work"; complains that shortages of skilled labor and lack of wage incentives are handicap to implementation.	<u>Pravda</u>
May 1962	Marshal Malinovskiy lists types of industry that primarily serve economic development but that can also be "completely converted to production of modern types of weapons." These include: special metallurgy; precision instrument building; automatic controls; atomic, missile [sic], and electronic industries; and aircraft and ship construction.	<u>Kommunist</u>

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<u>Date</u>	<u>Statement</u>	<u>Source</u>
10 May 1962	Khrushchev speaks to railroad workers stressing the need to convert to two-shift operation in machine building.	Soviet press
27 July 1962	Koustousov, Chairman of the State Committee for Automation and Machine Building, announces comprehensive plan for increasing specialization in machine building during 1962-65.	<u>Pravda</u>
11 December 1962	Supreme Soviet is informed that in 1963 "there will be a certain strain in the economy's supply of rolled steel sections, oil-line pipe, diesel fuel, and several types of equipment" and that "there is virtually no control over the huge outlays on superfluous equipment."	Senin speech in press
11 December 1962	Supreme Soviet notes lagging output of spare parts for most types of equipment.	Yasnov speech in press
11 December 1962	Budget Commission Chairman notes that specialization in machine building is inadequate and that in part this is due to incorrect planning; greater centralized control of planning for specialization is seen as required.	Yasnov speech in press
12 December 1962	Leningrad delegate to the Supreme Soviet states that Leningrad will conclude conversion to two-shift operation in 1965.	<u>Pravda</u>
6 January 1963	Khrushchev at exhibit instructs planning officials to find practical solutions for "pressing problems involved in production specialization and the introduction of new technology in the various branches of the national economy."	<u>Pravda</u>

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<u>Date</u>	<u>Statement</u>	<u>Source</u>
February 1963	Lead article in the Party journal of the armed forces justifies the 20-year program in terms of providing the basis for future qualitative change in military equipment; condemns lag in implementation of plant specialization as chief cause of lagging program for upgrading industrial technology.	<u>Journal</u>
27 February 1963	Khrushchev admits the burden of armaments and implies that the consumers must wait.	<u>Press</u>
27 February 1963	Koslov admits the existence of shortages of equipment that might interrupt the planned growth of particular products; cites plans to increase the number of shifts operated as a means to obtain additional output.	<u>Pravda</u>
16 March 1963	The creation of the Supreme Economic Council is linked, among other things, to the need for centralized direction of specialization and the introduction of new technology.	<u>Pravda</u>
19 March 1963	Chairman of the Leningrad Council of National Economy praises centralization as enabling measures of specialization that could not be undertaken by individual local councils alone.	<u>Pravda</u>

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APPENDIX B

SOURCE REFERENCES

Various statements, and particularly section II, have not been given source references but are supported by written project contributions that are available in the files of this Office.

1. Planovoye khozyaystvo, May 63, p. 35. U.
2. CIA. CIA/RR ER 63-2, Trends in the Soviet Economy, 1950-63, Feb 63, p. 11. S.
3. Ibid.
4. Ibid.
5. CIA. CIA/RR A.ERA 61-9, Index of Producers Equipment for the USSR, 1955-61 and 1965, Dec 61, p. 22-25. S.
6. Chernyavskiy, V.O. Ocherki po voprosam ekonomicheskoy effektivnosti (Essays on the Problem of Economic Efficiency), Moscow, 1963, p. 114. U.
7. Ibid.
8. Communist Party of the USSR. XXII S'yezd Kommunisticheskoy Partii Sovetskogo Soyuza, tom I; stenograficheskiy otchet (22d Party Congress of the CPSU, Volume I, Stenographic Notes), Moscow, 1962, p. 584. U.
9. Pravda, 11 May 62. U.
10. State, Moscow. Airgram A-553, 19 Oct 62. S.
11. Ekonomicheskaya gazeta, 9 May 63. U.
12. State, Moscow. Airgram A-658, 9 Nov 62. OFF USE.
13. Kommunist, no 15, Oct 62, p. 55-56. U.
14. Izvestiya, 31 Mar 63. U.
15. Vestnik mashinostroyeniya, no 2, Feb 63, p. 3-8. U.
16. Pravda, 27 Jul 62. U.
17. Ibid., 6 Jan 63. U.
18. Izvestiya, 11 Dec 62. U.
19. Kommunist vooruzhennykh sil, no 3, Feb 63, p. 12. U.
20. Pravda, 16 Mar 63. U.
21. Anisimov, G.D. Nauchno-tehnicheskii progress v period stroitel'stva kommunizma (Scientific-Technical Progress in the Period of the Construction of Communism), ser III, Economics, no 24, 1962, p. 34. U.
22. CIA. FBIS, Daily Report (USSR and East Europe), 3 Feb 61, p. CC 20. OFF USE.
23. Stroitel'naya gazeta, 13 Dec 61, p. 2-3. U.
24. Pravda, 5 Jan 63, p. 1. U.

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