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INTELLIGENCE MEMORANDUM NO. 245

1 November 1949

SUBJECT: Strategic Effectiveness of US Export Controls

Statement of the Problem

The US Export Control Act of 1949 has three main objectives:

- (a) "to protect the domestic economy from the excessive drain of scarce materials and to reduce the inflationary impact of abnormal foreign demand;
- (b) "to further the foreign policy of the U.S. and to aid in fulfilling its international responsibilities; and
- (c) "to exercise the necessary vigilance over exports from the standpoint of their significance to national security."

This paper is concerned solely with the national security aspects of the export control program and specifically with the effectiveness of US export controls as well as of parallel measures by other countries. The terms Soviet orbit and Soviet/Satellite refer only to the USSR, Finland, Poland, Czechoslovakia, Hungary, Rumania, Bulgaria, and Albania. No attempt has been made to estimate the effect on the Western European economy if the ECA nations adopted controls similar to those exercised by the US.

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SUMMARY

The US export control program has in general contributed substantially toward limiting the development of Soviet/Satellite economic capabilities for war. (For example, US shipments to the Soviet orbit (excluding Finland) of non-metallic minerals, metals, manufactured products, machinery, vehicles, and chemicals for the first six months of 1947 were valued at \$139,600,000; for the corresponding period in 1949, the value of these shipments had dropped to \$17,800,000. Although these shipments include some items not on the I-A and I-B lists, they generally represent the major categories to which restrictions are applied.) Enforcement of US export controls, however, has not been completely satisfactory nor have the controls been the sole factor in limiting the export of strategic items to the Soviet orbit. The time is rapidly approaching when numerous other limiting factors will no longer exist; the effectiveness of the export control machinery and administration will thus soon be put to a far more severe test than heretofore. One of the principal difficulties will be the extent to which the ECA nations can support the US export control program with effective restrictions upon the export of prohibited items to the Soviet orbit.

Thus far, implementation of the US export control program has been facilitated by the existence of the following conditions:

1. The US has been the principal source of supply (in many cases the only source) of the items on the control lists.
2. Exports of prohibited items from the US, in addition to being restricted by export controls, have been limited by:
 - (a) domestic shortages; (b) the high level of demand in the US; (c) the limited amount of dollar exchange available to most of the potential buyers of US products; (d) voluntary export controls by US manufacturers; and (e) the continuance of high prices.
3. Exports of prohibited items from other potential suppliers (mainly European) has been limited by:
 - (a) lack of an exportable surplus in ECA countries; (b) abnormal domestic demand for reconstruction and recovery; (c) export controls on some items by ECA nations; and (d) inability of the USSR or the Satellites to provide either the goods or the foreign exchange necessary to purchase the restricted items.

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The conditions listed above are rapidly disappearing. The degree of industrial recovery in Europe, and particularly the revival of industrial production in Germany and Japan, is eliminating most of the aforementioned restraints on Western European exports of strategic items to the Soviet orbit. Thus, to a greater extent than heretofore, effective implementation of the US export control program will depend upon the degree of cooperation that can be obtained from the ECA nations in establishing export control machinery and administration. Until now, "parallel action" by the ECA nations in establishing such controls has not been adequate and unless improved will materially undermine the effectiveness of the US export control program.

In view of the Kremlin's continued emphasis on developing the Soviet/Satellite war potential by expanding heavy industrial and military production, effective implementation of the US export control program would prevent the USSR and its Satellites from achieving production goals in many important segments of their economies and thus considerably delay the development of the Soviet/Satellite war potential. The items on the US I-A and I-B lists, however, are of varying importance with respect to their effect on the Soviet economic capabilities.

In general, the denial of special types of replacement parts, metal-working machinery, anti-friction bearings, precision and control instruments, petroleum refining equipment and petroleum products has been of major importance in impeding the development of certain vital lines of production. To a lesser extent, but still significantly, the expansion of the Soviet/Satellite economic potential has been retarded by restrictions on exports of such categories as certain chemicals and chemical equipment, non-ferrous metals and manufactures, steel mill products and equipment, electric power and transportation equipment.

The attached enclosures present a more detailed topical estimate of the effect of the US export control program on the Soviet war potential and the difficulties involved in administering the program.

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ENCLOSURE #1

Metalworking Machinery.

1-A List

The Soviet orbit does not have the capacity to produce most of the metalworking machinery listed as 1-A. For the most part, these items require special materials, specialized engineering knowledge, a high degree of skill in their manufacture and specialized manufacturing equipment. Any one or a combination of the above factors can prevent production within the Soviet orbit of such 1-A items as spiral bevel gear generators and gear cutting machines, automatic oscillating race radial grinders, dynamic balancing machines, and many other types of machine tools including those designed specifically for large-scale production of strategic products.

In the prewar period, the entire orbit, with the possible exception of Czechoslovakia, was largely dependent on imports of machine tools from countries outside the orbit. Although Soviet/Satellite production in the postwar period has not increased significantly over prewar levels, lend-lease assistance and wartime and postwar acquisitions have improved the inventory position. The current capability for maintaining this inventory, however, rests largely on the ability to import replacement parts and to cannibalize from inventory.

The character of Soviet postwar orders reflects a technological lag as well as a necessity for supplying industry with non-orbit machinery, equipment, and replacement parts. Current Satellite purchasing policy in addition reflects an urgent attempt to increase the production of capital goods both to satisfy Soviet demands and to compensate for the industrial deficiencies caused by the severance of normal economic relations with the West.

The value of US exports of metalworking machinery (1-A, 1-B and other) to the USSR totaled \$13,600,000 from January through June 1947; whereas, during the same six-months period in 1949, exports of this category to the USSR were valued at only \$108,000. This cutback is attributed largely to the US export control program.

US denials, however, have not entirely deprived the Soviet bloc of these necessary imports. Some 1-A machine tools have been shipped by ECA countries as a result of tardy parallel action, misinterpretation of US

commodity listings, and prior obligations, Switzerland, Sweden, Western Germany, and Austria have instituted no effective parallel action and have supplied a significant quantity of 1-A items.

Controls in this category have been effective in limiting exports to support some vital sectors of the orbit economy; but their utility is seriously threatened by inconsistencies in denials and approvals, nomenclature difficulties, the lack of parallel action, and clandestine trade.

1-B List

US controls in this category have been generally effective; but Western European exports have largely negated US efforts. Although these shipments have contributed substantially to postwar recovery in many segments of the orbit economy, the rate of industrial expansion within the eastern bloc will depend in a large measure on the continued imports of this machinery and replacement parts for machinery on hand.

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ENCLOSURE #2

Anti-Friction Bearings.

I-B List

Anti-friction bearings (ball, roller, and needle bearings) are of critical importance in the production of aircraft, tanks, armored vehicles, trucks, and in the machines used for the manufacture of shells, bombs, guns, and all items of munitions, as well as for machine tools and mechanical production equipment of all types.

Of the countries in the Soviet orbit, only the USSR and the Sovzone of Germany are now producing complete bearings. Czech production consists in assembling bearings from imported component parts and some domestic parts. Before the war the USSR and the Satellites depended to a great extent upon Sweden and Germany for their supply of precision anti-friction bearings.

During the war, the Soviet Union placed a high priority on imports from the US of anti-friction bearings, and ordered many millions of them for use on aircraft and tanks. The initial requisition, totalling over eight and one-half million bearings, was quickly supplemented by requests for additional quantities. According to Soviet Ambassador Litvinov, Soviet production was neither suitable nor sufficient for these requirements.

The emphasis of the Soviet orbit on the building up of its war machine has placed an unusual demand on anti-friction bearings. The production of Czechoslovakia and the USSR falls short of meeting requirements. For many of the critically required sizes, the Soviet orbit is 100 percent dependent upon imports. The USSR and Czechoslovakia are dependent upon Sweden for the special alloy bearing steels. Although Sweden continues to make sizable shipments, complaints of insufficient tonnage requirements have been registered repeatedly.

The value of US exports of anti-friction bearings and components to the USSR and Satellites (including Finland) dropped from approximately \$850,000 in the first six months of 1947 to about \$155,000 in the same period in 1949. This is attributed largely to the inhibiting effects of export control and to a lesser extent, to actual denials of licenses.

Up to this date, parallel action of ECA countries has not passed beyond the discussion stage. As a matter of fact, the US has not itself placed anti-friction bearings on the I-A list. The matter is presently up for action with a recommendation of a technical committee that it be raised from I-B to I-A due to their strategic importance.

Exports from ECA countries continue to the Soviet orbit based to a large extent on trade agreements. Most of the major producing countries have indicated that they will cooperate in establishing export controls.

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With the possible exception of Sweden, it is anticipated that these will be made effective in the near future.

Non-ECA countries are not producers of bearings and as such are not a factor. Switzerland's total production amounts to about four and one-half million. Their exports, while important in the precision class, are not large.

Clandestine trade in anti-friction bearings has become a big business in Europe. Ample evidence of this is available and has been confirmed. Shipments range in size from carload lots to suitcase loads. Principal routes are through Germany, Switzerland, and Austria. Sources of supply include the US, Bizonia, Italy, and Sweden with preference given to products of the US and Sweden as being of higher quality. Trade organizations set up by the USSR, Czechoslovakia, and Poland, directed by Moscow, have as one of their major objectives the securing of bearings of various sizes. Lists obtained indicate the high priority given to those sizes suitable for tank production and the quantities involved eliminate the possibilities of their use in heavy machinery or normal industrial use.

Up to the present time, export controls have been to a great extent on a voluntary basis by most US bearing manufacturers. Some dealers have exported bearings ostensibly to Switzerland or to the ECA countries. Many of these shipments have been traced as transshipments to the Soviet orbit, some through Holland, others through Belgium or France.

The potential effectiveness of export controls is very great and would seriously hamper further development of the Soviet orbit military potential. Even without the cooperation of Sweden, the result would be about 85 percent effective in reducing production of the Soviet orbit by a very wide margin. The USSR has prohibited Czechoslovak machine builders from using Soviet bearings in machine tools destined for the USSR. It appears hardly possible that they would use these bearings of obviously low quality in aircraft, tanks, or other weapons where replacement would not be possible in the event of failure.

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ENCLOSURE #3

Precision Instruments, Scientific Apparatus, Electronic Testing Equipment,
and Allied Items.

1-A and 1-B Lists

The Soviet orbit is experiencing a shortage of precision instruments, scientific apparatus, electronic testing and control equipment and allied items. This type of equipment is of the utmost importance in the control of quality production and is essential to any program of research and development. Only three countries within the orbit, the USSR, Czechoslovakia, and Hungary, produce significant quantities of items in this category. The sum of their production cannot fill the needs of the orbit economy.

The three major producers lack one or more of the elements necessary for production -- technical knowledge, proper grade materials, or equipment used in production. The remaining orbit countries lack all of these or possess them in insignificant amounts.

Prewar sources for these items were the US, Canada, the UK, France, Belgium, Holland, Switzerland, Sweden, Italy, Germany, Austria, and Japan. As a result of US export control and cooperation by some of these countries, and war damage in some of the others, these sources are no longer open to the Soviet orbit for unlimited use.

The shortage was manifested in the heavy postwar influx of orders by orbit nations to those countries which were able to supply the precision and electronic instruments and apparatus. Many of these orders were never filled. After the introduction of export controls, these orders continued for a trial period; then Soviet orbit orders decreased sharply.

The value of US exports to the orbit in eight important categories of precision apparatus totalled \$3,900,323 in the first six months of 1947 compared with only \$93,971 for the same period of 1949. Over 50 percent of the 1949 figure represents shipments to Finland. These categories include electric indicating instruments; recording instruments and testing apparatus; starting and controlling equipment; testing machines; industrial indicating, recording and control instruments; microscopes and accessories; and scientific instruments and laboratory apparatus.

In order to acquire precision and electronic equipment, the orbit countries have attempted to circumvent export control and its effects. In order to avoid export control regulations, they have placed orders with

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firms outside the US and have placed orders, broken into small lots, with firms in the US. Some ECA countries, notably the UK and France, have given fairly close cooperation with US control measures. Others, however, mainly the Netherlands, have been freer in their interpretation of US regulations and more generous with their trade policy with the orbit.

Clandestine trade transactions and illicit shipments have also been employed as a means of circumventing the effects of US control.

US export controls in this category have had several important results. In some cases the Soviet orbit has been denied new production facilities for precision instruments. In other cases existing plants have been unable to achieve planned increases in production where such increases were dependent on the import of US equipment. There are also instances of actual decreases in the production of Soviet orbit industries resulting from lack of vital control equipment. Lack of these items has also hindered the development of automatic machines and proper heat treatment of alloy steels. Lack of testing equipment has resulted in a decrease in the quality of Soviet orbit products. A shortage of laboratory apparatus has slowed down industrial and scientific research.

Although effectiveness of controls has been great, parallel action by ECA countries would dry up remaining sources of supply outside the Soviet orbit and thereby accelerate the developments mentioned above.

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ENCLOSURE #4

Petroleum Products and Equipment.
I-A and I-B Lists

Shortages of oil-well and specialized refinery equipment which have caused the present tight petroleum situation in the USSR and satellites, constitute the major difficulty of the Soviet orbit petroleum industry. These deficiencies have hampered the rapid expansion of crude oil production, while the continuing shortage of specialized types of refinery equipment such as catalytic cracking plants, and alkylation and polymerization units has seriously restricted Soviet availability of vital high-octane aviation gasoline. This adverse situation in the Soviet orbit apparently cannot be alleviated by the expansion of oil equipment production partially as a result of shortages of fabricated steel, measuring and control instruments, and other complex elements of the specialized types of refinery equipment referred to above such as special pumps, valves and reactors.

US shipments of petroleum products during recent years have not been instrumental in relieving the tight petroleum shortage or aiding any possible war preparation by the Soviet Union or its satellites. In 1947, these shipments totalled only 0.5 percent of total Soviet supply and were considerably less than the amounts exported by the Soviet Union. With the exception of high-octane aviation gasoline, and perhaps special additives and lubricants, it is doubtful if cessation of petroleum exports of this magnitude has had any appreciable effect on the Soviet-satellite war potential or economic development.

The Soviet and satellites petroleum industry has never been self-sufficient in oil equipment and has had to rely heavily on foreign countries, especially the US. The long-standing inadequate supply of drilling and other oil field equipment is shown by the fact that a shortage of drilling equipment prevented increase in crude oil output during the Second Five-Year Plan.

The oil equipment deficiency, which retarded the prewar development of the petroleum industry, was aggravated during the war by destruction of plants producing refinery equipment and by conversion of oil equipment plants to armament production. US shipments of approximately \$64 million worth of equipment to the USSR during 1941-1944 was a decisive factor in keeping the Soviet petroleum industry in operation.

Because the planned postwar expansion of the Soviet orbit petroleum industry depends in part on the availability of equipment, and proper exploitation of producing fields, considerable emphasis has been placed on the rapid development of the equipment industry. By 1950, Soviet oil field equipment production is planned to be 2.5 times the output in 1940, with a considerable increase in the variety of items manufactured. An indication of Soviet requirements may be found in the \$10 million worth of equipment shipped

to the USSR from the US in 1947; about half was drilling equipment, and the remainder cementing and prospecting equipment. During the first half of 1947, some well-drilling equipment was shipped by the US to Poland and Yugoslavia. There were no shipments sent to the satellites in the first half of 1949. No refinery equipment was shipped in either period.

It is estimated that the USSR can produce only 35-50 percent of its high-octane combat aviation gasoline requirements for full operational requirements. Specialized equipment, such as catalytic cracking plants, was introduced only after the end of the war by the shipment and construction of two complete American Houdry units under lend-lease.

While the western embargo on shipment of oil field and refinery equipment has drastically hampered present Soviet-satellite oil production, the action on the part of the west has been instrumental in (a) limiting oil field exploration and exploitation; (b) delaying the expansion of refinery facilities principally for the production of high-octane gasoline; and (c) has probably delayed any schemes of stockpiling strategic quantities of high-octane gasoline and lubricants. Control over IA and IB shipments exercised by the ECA countries has largely prevented the Soviet Union and its satellites from circumventing US control.

ENCLOSURE #5

Non-Ferrous Metals and Minerals.

1-A and 1-B Lists

Copper, lead, and industrial diamonds are in short supply in both the Soviet and satellite economies. Tin and its products, such as tin plate and bearing metals are likewise decidedly short. The denial of any one of these materials to the orbit, while not enough to disrupt all military and civilian production, would be a retarding factor. Even before the war the area was dependent on imports of copper, lead, tin, and industrial diamonds from Germany, Belgium, the Netherlands, Britain, and the United States. Yugoslavia also contributed, and its loss as a source of supply for copper and lead is forcing greater dependence on non-orbit sources.

There is very little parallel action by the ECA countries and while control is sometimes pledged, it has been circumvented in various ways. Industrial diamonds are on the 1-A list, but the Netherlands supplies them to the Soviets under a trade agreement signed before the lists were prepared. Copper, lead, and tin are supplied by Chile, Mexico, Argentina, Northern Korea, and China, all non-ECA countries. In addition, there is a clandestine trade in copper, lead, tin, and diamonds through the western zones of Germany, Austria, Switzerland, Belgium, and the Netherlands; and in tin through China, Indochina, Siam, and Burma.

US controls have worked fairly well, and if parallel action could be secured from the ECA countries, the shortage would be felt in all countries of the Soviet orbit despite small shipments from non-ECA countries.

Enclosure #6

Electric Power Generating and Distribution Apparatus.

1-B List

In the electric power industry, the major items in critically short supply are steam and hydroelectric turbines and generators; switching and control equipment; large power transformers; steam boilers and boiler tubes; electrical indicating instruments; and electric motors of over 200 H.P.

Comparative US export figures for the first six months of 1949 reflect the impact of export controls; the total amount is less than one-sixth of that of the comparable 1947 period. Moreover, there is a radical change in the pattern; the USSR accounted for about 80 percent of the 1947 amount, whereas Finland accounted for 80 percent of the 1949 amount, Poland 18 percent, and the USSR less than 1 percent.

Despite the lack of firm information as to the volume of electrical imports actually being delivered within the orbit from Western sources, it is believed that US export controls have been effective in retarding the industrialization plans of the orbit countries through restrictions on electric power equipment. Even though the output of electricity in the USSR and some of the Satellites closely approximates the Plan goals, this result is being obtained by excessive use and overloading of existing equipment with consequent accelerated depreciation and lack of reserve capacity so necessary in case of national emergency.

More electricity is available throughout the orbit than ever before, but the demand for it is greater. Maintenance of adequate electric service requires vital repair parts most of which must come from Western sources because the original equipment, particularly in the Satellites, came from Western Europe and the US. Pre-war sources must also continue to contribute the major portion of the equipment needed to increase electric capacity, at least for the next five to ten years. Continuation and improvement of export controls will hamper industrial processes generally and delay the orbit in reaching self-sufficiency in electric equipment.

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ENCLOSURE #7

Transportation.

1-A and 1-B Lists

The most pronounced shortage in the Soviet orbit transportation system is that of railroad rails. This shortage has reduced the normal maintenance replacement of worn rails and is a factor in the Soviet failure to meet the railroad construction plan. The shortage is not viewed as acute because right-of-way maintenance is apparently above minimum operating levels, and because new road construction of economic as well as strategic importance has been going on throughout the orbit area.

Other apparent shortages are:

In the USSR -- tank cars, tank trucks, ocean-going tankers, heavy-burden freight cars (including well-cars), and tires and tubes;

In the Satellites -- motor trucks, tires and tubes, locomotives, railway signal equipment, and safety devices.

Freight cars are not regarded as seriously short because they are in excess of the prewar inventory and are being manufactured at nearly double the prewar rate in the USSR and about 10 times the prewar rate in satellites. Locomotive inventory is 7 percent above prewar throughout the orbit, but is 1.7 percent below prewar in the satellite area. The shortage has caused local traffic delays in some areas of the satellites, but has not been critical anywhere. (The shortage was worst in Eastern Germany, but it did not reach the point where columns of locomotives had to be taken out of reserve.)

Motor trucks are believed to be adequate in the Soviet Union, in view of the limitations of the road network, but are in short supply in the satellite area where the road systems are much better developed. The shortage of tank trucks is not critical in the orbit. They are required primarily for short hauls; long haul deliveries of petroleum products are generally effected by rail. Necessary inventories of tank trucks for the Soviet Union can be maintained from the ample truck production.

Tankers are the weakest listing in the Soviet and Polish merchant fleets, which are now larger than ever before. The other orbit merchant fleets are below prewar listings and are equally weak in tankers. Greatly expanded merchant navies are planned for the entire orbit, but the bulk of the increase

must be procured from abroad because orbit shipbuilding has not yet developed the capacity to replace obsolete vessels.

The Soviet Union produced virtually all its own basic transport equipment before the war. Satellite countries produced the larger quantity of their replacement items but their basic railroad inventories were built in Germany and Austria, which countries supplied some replacement equipment in the interwar period. The satellite areas procured motor vehicles in the prewar years in the world market. Germany, the US, Austria, and Italy were the chief suppliers, German and US vehicles being assembled in several east European plants.

Such items as railroad signal equipment, airbrakes, and automatic couplers came chiefly from Germany and the US.

Current capabilities of the orbit to produce major transportation equipment items, locomotives, freight cars, rails, and trucks cannot be called critically inadequate. Special equipment is more difficult. There is some production of signal equipment, automatic couplers, and airbrakes in the orbit, but the orbit has made attempts to procure some of these items from the west. Their importance is greater than is at first apparent because they are capable of greatly increasing line capacities without changing the locomotive or rolling stock establishment.

The extent of the present shortage is most apparent in spare parts for motor vehicles and aircraft, and in merchant vessels, particularly ocean-going tankers. Some shipping on Soviet orbit account is under construction in yards of England, Holland, Belgium, Denmark, Sweden, and Italy.

Export controls governing the shipment of transport equipment from the US to the Soviet orbit have been effective. Shipments of the key items -- Diesel engines, locomotives, and freight cars -- were much smaller in the first half of 1949 than in the first half of 1947, and the export of locomotive and car parts fell sharply over the same period.

During the first six months of 1947, shipments to the orbit were made which are now covered by 15 of the 23 restricted categories on the "A" and "B" lists. A large majority of them went to the Soviet Union, including 129 out of 241 Diesel engines, 102 of the 111 locomotives, all of the 29 freight cars, and 99 of the 111 five-ton trucks.

From January through June 1949, shipments representing only nine of the restricted items were made, and the sole shipment to the USSR consisted of three trailers. Altogether, neither locomotives nor freight cars, and only twelve five-ton trucks and two Diesel engines were exported to the orbit during the

first half of 1949. All of the tires and tubes, Diesel engines, and condenser tubes, and all but one of the trucks were shipped to Finland.

Although known exports of major transport equipment from ECA countries have been limited to the merchant ships on order in western shipyards mentioned above, and to motor trucks and busses built in Britain, France, and Italy for satellite states, eight trade agreements have been made between ECA and orbit countries for supply of 1A and 1B list items. Some components, such as wheel rims, boiler and condenser tubes, and axles, were imported from the US in large quantities in 1947 and from Bizonia until the "counter blockade" of 1948. Some clandestine traffic in aircraft and aircraft parts has gone on between Western Europe and the satellite area, particularly Czechoslovakia.

In summary, the US controls have been highly successful in reducing orbit procurement of 1A and 1B items, but they have brought about no critical shortages in Soviet and satellite transportation systems.

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ENCLOSURE #8

Manila and Sisal and Their Products.

1-B List

US controls in this category have not been effective since the US is not the primary producer either of these commodities or of henequen which is the leading substitute. The USSR is purchasing substantial quantities of henequen from Mexico.

ENCLOSURE # 9

Steel Mill Products and Equipment.

1-A and 1-B Lists

Inability to procure raw materials for the production of high grade steels and installations as well as for machinery and equipment for the modernization and expansion of the steel industries, is impeding the fulfillment of the economic plans of the Soviet orbit countries. These raw material shortages include steel-alloying elements such as cobalt, molybdenum, vanadium and tungsten. There also is a shortage of seamless tubing, and of tin for tin plate. A critical need exists for rolling-mill installations in the orbit, particularly in Poland, which has no blooming and slabbing mill facilities, and in Czechoslovakia.

Before World War II, the Soviet bloc experienced no difficulties in obtaining raw materials through imports or in procuring needed equipment from the more industrialized countries of the world. That situation no longer exists.

During and directly after World War II, the Soviets and Satellites placed large orders for steel mill equipment with different US companies. Although some of this equipment was completed, refusal to license the shipments has prevented this much-needed equipment from reaching the USSR.

The outstanding example of the effectiveness of export license restrictions in Czechoslovakia was the denial of licenses in 1948 for a \$15,000,000 rolling mill which was ordered in 1947 from [redacted] Without such a rolling mill, or a similar one from some other country (which would take several years to complete), there will be no large increase in rolled-products output in Czechoslovakia for the foreseeable future.

In June 1949, a request for an export license for a blooming and slabbing mill, built by [redacted] and the accompanying [redacted] equipment which had been manufactured by [redacted] is refused again to the Polish-American Supply Corporation, acting on the behalf of the Polish Government. The Polish Government placed tremendous importance on the acquisition of the mill and failure to procure it has seriously impeded plans to increase raw steel production in Poland.

US exports of these items to the orbit in the first six months of 1949 showed a sharp decline as compared to the corresponding period in 1947. This reduction, however, has been partially offset by trade with ECA and non-ECA countries and by some clandestine trade.

Although export licensing has not stopped expansion of the Soviet orbit steel industry, it has certainly hindered greater expansion and slowed down certain technological improvements. If the US secures parallel action by the ECA countries, the orbit countries must depend on themselves alone for improving and advancing their steel-making technology as the latest US and European machinery prototypes are no longer available. This would be a much slower process than was formerly the case when machines could be built abroad and installed by competent western engineers.

Chemicals

1-A and 1-B Lists

Only a few of the chemicals on the 1-A and 1-B lists have large tonnage requirements and all can be produced in the Soviet orbit if necessary. Soviet and satellite planners, aware that these products are essential to carry on a war, have probably worked out plans for their production. With limited technical personnel, equipment, and plants, however, they are forced to allocate facilities and personnel to the most important chemical requirements of the moment.

Some stabilizers, accelerators, anti-oxidants, and oxidants for rubber, synthetic rubber, and plastics, particularly the thermo plastics such as acrylic, vinyl, polystyrene and fluoroethylene types, seem short and great efforts have been made to obtain these, especially tetramethyl thiuram disulphide, an essential ultra-accelerator for Sovprene (Neoprene). Also, there seems to be a serious shortage of carbon black for rubber fabrication. Production is known in Rumania, and in the petroleum refining areas of the USSR. Attempts have been made to obtain US carbon black through transshipment through Mexico, Cuba, Belgium, Holland, England and Switzerland. Therefore, it is believed that they can and are producing essential chemical products. However, materials of a certain specification to meet a specific need may be unobtainable, and the shortages will force development and production of the required material.

It is estimated that shortages of chemicals on the 1-A and 1-B lists while having a definite retarding effect, have not affected the peacetime operations of the USSR or satellites nearly as much as has the restriction on shipments of special chemical equipment and accessories. The shortage of the chemicals on the lists has probably accelerated the necessity for the development of these products and the "know-how" for production of potential military needs.

ENCLOSURE #11

Chemical Equipment

I-A and I-B Lists

With few exceptions, all the chemical equipment items on the I-A and I-B lists are manufactured in either the USSR or Czechoslovakia; fabricating plants are either nonexistent or negligible in number in the other satellite nations. The supply of chemical processing equipment and spare parts, however, is reportedly not sufficient to meet the demands of the large restoration and expansion programs of these countries.

Lack of fabricating equipment may also have caused the reported shortage of processing equipment for the plastics industry, as well as shortages of motor vehicle tires. Specific examples of shortages of chemical equipment are glass-lined equipment, special valves, recording and control apparatus, reactors, vacuum and pressure pumps, and special alloys for various uses. Requests that the US supply penicillin plants point to an inability to produce this equipment.

Numerous requests from these countries for complete plants and for special types of processing equipment indicate a serious weakness in fabricating capacity which cannot be easily or quickly overcome. The production of sulphuric acid, especially in the Sovzone of Germany, has been considerably hampered by the lack of spare parts for equipment.

After World War II, much chemical equipment was dismantled and removed from the occupied countries. Most of this equipment was transported to the USSR and a considerable part of it was probably never reassembled. Part of it apparently was irreparably damaged in transit, and much of that not damaged was corroded and otherwise deteriorated when it was stored in unsheltered locations. The USSR, however, undoubtedly succeeded in reassembling some of the equipment, which not only increased the existing manufacturing capacity, but supplied valuable models from which copies could be made.

It is believed that the export control of the equipment items on the I-A and I-B lists has been a potent factor in retarding the growth of industrial chemical capacity and consequent military potential of the USSR and satellites.

Addendum to Intelligence Memorandum No. 245
"Strategic Effectiveness of US Export Controls"

Coal Equipment

1-A List

The USSR, Poland, and Czechoslovakia are the major coal producers of the orbit and each has its own plants for producing mining equipment. In general, lack of spare parts is one of the greatest impediments to increase coal production. Progress has been made in overcoming shortages of coal cutters, drilling machines, mechanical loaders and haulage motors; however, shortages of mechanical equipment in other fields extend to coal equipment production. However, many deficiencies in mechanical equipment necessary to meet planned coal production targets can be made up by a plentiful supply of labor.

Construction of coal preparation plants in the Soviet Union is lagging and it is estimated that this phase of the industry will not attain the goal set for 1950. There are numerous complaints about the quality of coal produced in the Soviet Union and Poland.

During the first half of 1947, the US exported to the Soviet Union about \$2,000,000 worth of such 1-A items, as coal cutters, rock drills, mining machinery and parts. Coal cutters alone were valued at \$639,644. The Soviet Union received only \$2,379 worth of coal mining equipment during the first six months of 1949. In view of the importance of Polish coal to Europe, controls were relaxed and shipments to Poland amounted to about \$620,000 for the 1947 period of which \$381,000 were coal cutters. During the first half of 1949 exports amounted to \$49,000. Comparable figures for Czechoslovakia show \$367,000, of which \$110,265 were coal cutters in the first half of 1947. In 1949, equipment valued at \$45,659 was shipped.

The USSR, Poland, and Czechoslovakia received \$750,000 worth of 1-B items in the first six months of 1947, whereas in the same period of 1949 they received only \$3,400 worth.

As far as is known, there have been no appreciable shipments of 1-A and 1-B items to the Soviet orbit countries from ECA and non-ECA countries since export controls have been applied. Outside of the Soviet orbit and the US, the only other countries which have been important producers of coal mining machinery are the UK, France, and Germany. The plight of the coal mining industry in the UK and France is well known. Both have been concentrating on

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mechanization and have been importing considerable mining equipment from the US. It is unlikely that the Soviet orbit has obtained any significant quantity of coal mining equipment through clandestine transactions.

Export controls on coal mining equipment from the US have been relaxed to assist certain satellite states to enlarge export surpluses available to Western Europe. Controls have been effective, however, in limiting the expansion of mechanization and production in the USSR.