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Economic Intelligence Report

SOVIET BLOC AID TO UNDERDEVELOPED COUNTRIES IN THE FIELD OF ELECTRIC POWER



CIA/RR ER 63-6

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CENTRAL INTELLIGENCE AGENCY

Office of Research and Reports

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SECRET

Economic Intelligence Report

**SOVIET BLOC AID
TO UNDERDEVELOPED COUNTRIES
IN THE FIELD OF ELECTRIC POWER**

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FOREWORD

The present report was undertaken to determine the amount of Soviet Bloc aid to underdeveloped countries in the field of electric power; to evaluate the progress, problems, and prospects of this aid program; and to assess the effects of the aid on the countries involved. Discussion is confined to aid from the USSR and the European Satellites. Although Communist China had completed aid agreements with several African and Asian countries by 1962, none of this aid has resulted in a contract for construction of an electric power project.

For the purposes of this report, the term underdeveloped country refers to a country that is so defined in the semiannual reports of the Economic Intelligence Committee on Sino-Soviet Bloc Economic Activities in Underdeveloped Areas. Cuba is therefore included as a recipient country rather than as a member of the Bloc. All dollar values mentioned refer to current US dollars.

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- iii -

S-E-C-R-E-T

S-E-C-R-E-T

CONTENTS

	<u>Page</u>
Summary and Conclusions	1
I. Introduction	5
II. Use of Electric Power Aid to Pursue Goals of the Comprehensive Economic Aid Program for Underdeveloped Areas	6
III. Soviet Bloc Electric Power Aid Programs	9
A. Soviet Program	9
1. UAR	10
2. India	13
3. Cuba	14
B. European Satellite Programs	15
C. Effects of Aid Projects on Recipient Countries	16
IV. Problems and Prospects	19
A. Problems	19
B. Prospects	20

Appendixes

Appendix A. Electric Power Projects in Underdeveloped Countries Undertaken with Soviet Bloc Aid as of 1 July 1962	23
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50X1

Tables

1. Sources of Soviet Bloc Aid to Underdeveloped Countries for Electric Power Projects as of 1 July 1962	2
2. Shares of Underdeveloped Countries in Soviet Bloc Aid for Electric Power Projects as of 1 July 1962	6

S-E-C-R-E-T

	<u>Page</u>
3. Estimated Soviet Bloc Financial Aid to Underde- veloped Countries in the Field of Electric Power as of 1 July 1962	11
4. Soviet Bloc Aid Related to Total Installed and Planned Generating Capacity in Underdeveloped Countries	18

Maps

	<u>Following Page</u>
Figure 1. Electric Power Projects Undertaken with Soviet Bloc Aid in the Middle East	6
Figure 2. Electric Power Projects Undertaken with Soviet Bloc Aid in South Asia	6
Figure 3. Electric Power Projects Undertaken with Soviet Bloc Aid in the Far East	6
Figure 4. Electric Power Projects Undertaken with Soviet Bloc Aid in Africa	6
Figure 5. Electric Power Projects Undertaken with Soviet Bloc Aid in Latin America	6

S-E-C-R-E-T

SOVIET BLOC AID TO UNDERDEVELOPED COUNTRIES
IN THE FIELD OF ELECTRIC POWER*

Summary and Conclusions

Soviet Bloc aid to underdeveloped countries in the field of electric power is an important part of the technical assistance program of the Soviet Bloc that was undertaken after Stalin's death to establish contacts with underdeveloped countries of the Free World, to reduce the influence of major Western countries in these areas, and to tie the underdeveloped countries more closely to the Bloc. Total Bloc aid to underdeveloped countries has been extended for two types of projects: the impact type, which has a strong immediate appeal to the local populace, and the type that provides a basis for long-range economic development of the recipient country. Aid in the field of electric power, almost without exception, has been extended for long-range development. Electric power projects have included surveys to locate and map hydroelectric resources as well as the actual construction of powerplants, both hydroelectric and thermal electric, which will support general industrial growth and supply power for steel mills, oil refineries, cement plants, and other industrial establishments, some of which also are being built with Bloc aid. Good examples of aid for long-range development are afforded by the Aswan High Dam and Hydroelectric Powerplant in the United Arab Republic (UAR -- Egypt) and by India, where one-third of the 7,000 megawatts (mw) of new capacity to be added during the Third Five Year Plan (1961-66) is scheduled to be built with Bloc assistance.

The Bloc has been quite successful in using aid for electric power development as a means of establishing contacts in underdeveloped countries. During the 8 years since aid was first extended, contracts have been signed with 19 underdeveloped countries in Africa, Asia, Europe, and Latin America providing for aid in the construction of 52 powerplants and the completion of 10 hydroelectric surveys. For these projects, Bloc countries have obligated \$775 million, which is about 17 percent of the total economic credits extended by these same Bloc countries to underdeveloped countries since 1953. Of the \$775 million, 71 percent has been obligated for projects in the UAR and India. The bulk of the aid in the field of electric power has been furnished by the USSR (79 percent) and Czechoslovakia (13 percent), with Poland, East Germany, and Hungary providing the rest, as shown in Table 1.** Thus far, 10 powerplants, with

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

** Table 1 follows on p. 2.

S-E-C-R-E-T

S-E-C-R-E-T

Table 1

Sources of Soviet Bloc Aid to Underdeveloped Countries
for Electric Power Projects a/
as of 1 July 1962

<u>Country</u>	<u>Credits Obligated</u>		<u>Capacity Contracted</u>	
	<u>Million Current US \$</u>	<u>Percent of Total</u>	<u>Megawatts</u>	<u>Percent of Total</u>
USSR	614	79	4,663	76
Czechoslovakia	104	13	921	15
Poland	43	6	450	7
East Germany	6	1	30	Negl.
Hungary	7	1	60	1
Total	<u>775</u>	<u>100</u>	<u>6,124</u>	<u>100</u>

a. For a detailed list of recipient countries, see Table 3, p. 11, below. Because of rounding, components may not add to the totals shown.

a total capacity of 198 mw, have been completed with Bloc assistance -- in Afghanistan, Cambodia, Iceland, India, Turkey, the UAR, and Yemen -- and construction has been started or planned for 42 more powerplants with a total capacity of more than 5,900 mw.

The execution of the program, however, has not been entirely successful. As projects have advanced from negotiation to the construction stage, the Bloc has found itself in the position of trying to save the favorable impression created initially by its offers of assistance. The failure to complete powerplants on schedule and within estimated cost limits, the poor quality of some of the equipment supplied, and the excessive period required to complete hydroelectric potential surveys have led to disillusionment and have even engendered ill will toward the Bloc in some of the recipient countries.

The delays and equipment problems that have arisen in connection with the aid projects probably are no more serious than the Bloc countries normally experience in construction of their own powerplants, but the underdeveloped countries, perhaps oversold during the propaganda and negotiation phase of the program, are impatient. Many of the problems can be attributed to the fact that Bloc countries have

S-E-C-R-E-T

not undertaken aid projects on a turnkey basis* as has the US. Bloc countries have provided plans, equipment, technical supervision, and foreign exchange credits, but each recipient underdeveloped country is responsible for administrative supervision of construction and installation work, for providing local labor and supplies, and for obtaining funds to cover these local costs. Local shortcomings in performing these responsibilities have contributed to the slow progress on the Aswan Dam project in the UAR and on powerplant projects in other underdeveloped countries.

With its prestige at stake in the underdeveloped countries, the Bloc is confronted with a necessity greater than usual for setting priorities and making sacrifices in the allocation of its resources. The program for production of electric power generating equipment for underdeveloped countries was superimposed on a program for expanding the capacity of the power industries of the Sino-Soviet Bloc which was already so ambitious that an attempt to fulfill it would have badly overcommitted Bloc capabilities for building and equipping powerplants. Addition of the program for aid to underdeveloped countries would have overcommitted the Bloc resources further were it not for the fact that shipments of power equipment to Communist China have been reduced sharply since 1960, thus reducing the burden on Soviet Bloc suppliers of equipment. Although aid to China is now being increased, it has not presented thus far a serious problem for Bloc suppliers of equipment. Czechoslovakia has been meeting its commitments abroad and probably will continue to do so. The installation of new generating equipment in Czechoslovakia, however, has been falling behind schedule, and much of the existing equipment is old and in frequent need of repairs. Any relief for the domestic industry will depend on revision of priorities. The USSR, in order to meet its commitments both to other Bloc countries and to underdeveloped countries, will have to cut back its program for installation of equipment at home from the rather ambitious levels planned to a level more in keeping with the electric power that probably will be required.

There are several indications that the Bloc takes the matter of saving its prestige very seriously and that it is willing to make sacrifices to fulfill its obligations to the underdeveloped countries. There may be some stretching out of construction schedules within Bloc countries to permit extra effort on selected aid projects in underdeveloped countries, although it is probable that first priority will be given to the Bloc electric power industries. By straining the capabilities of its construction and equipment industries, however, the Bloc probably will be able, in general, to make good on its commitments to underdeveloped countries, although projects probably will continue to be late and quality may not be entirely satisfactory.

* Assumption of all risks and responsibility for turning over to the recipient country a completed, operable plant.

S-E-C-R-E-T

I. Introduction

During the Stalin regime the USSR and the European Satellites had little contact with countries outside the Soviet Bloc. After Stalin's death the Soviet Bloc undertook, in 1954, a technical assistance program designed to establish contacts with the underdeveloped countries of the Free World and, once the initial contacts and relationships were established, to reduce or if possible to eliminate the influence of the major Western countries in these areas. The experience that the USSR and Czechoslovakia had gained in aiding the reconstruction and further development of Communist China in the early 1950's undoubtedly furnished a basis for further foreign operations.

Electric power is one of the major fields in which Soviet Bloc countries are giving economic and technical assistance to underdeveloped countries. Aid obligated by the Soviet Bloc countries for the construction of electric powerplants amounts to \$775 million, which is about 17 percent of the total credits extended to underdeveloped countries by Bloc countries that are giving aid in electric power development.* It is planned that this aid will help build power projects with a total capacity of about 6,100 mw. In addition to projects for which contracts have already been concluded, a number of technical surveys for hydroelectric power projects have been or are being made. These surveys could lead to the construction of considerable additional capacity for power generation.

The first Soviet Bloc contracts for the construction of electric powerplants in underdeveloped areas were signed in 1955. During 1957-62, Soviet Bloc countries placed 11 powerplants in operation in the underdeveloped countries of the world. By the middle of 1962, Soviet Bloc officials were active in at least 19 countries, making surveys, drawing up technical plans, supplying equipment, and providing technical supervision for the construction of electric powerplants. Data on electric power projects undertaken in underdeveloped countries with Soviet Bloc aid are given in Appendix A. The approximate locations of the electric power projects which have been undertaken are shown on the maps, Figures 1 through 5,** and the amount of aid that has been extended by Bloc countries to the underdeveloped countries of the Free World is shown in Table 2.*** The USSR and Czechoslovakia have been most active in furnishing electric power aid, while East Germany, Hungary, and Poland have offered assistance to a much lesser degree.

* Albania, Bulgaria, Rumania, and Communist China have not supplied any aid in the field of electric power.

** Following p. 6.

*** Table 2 follows on p. 6.

S-E-C-R-E-T

S-E-C-R-E-T

Table 2

Shares of Underdeveloped Countries in Soviet Bloc Aid
 for Electric Power Projects
 as of 1 July 1962

<u>Recipient Country</u>	<u>Credit Obligated</u>		<u>Capacity Contracted</u>	
	<u>Million Current US \$</u>	<u>Percent of Total</u>	<u>Megawatts</u>	<u>Percent of Total</u>
Afghanistan	26	3	80	1
Argentina	7	1	50	1
Brazil <u>a/</u>	36	5	314	5
Cambodia	5	1	21	Negl.
Cuba	71	9	656	11
Ghana	8 <u>b/</u>	1	0 <u>b/</u>	0
Guinea	5 <u>b/</u>	1	0 <u>b/</u>	0
Iceland	2	Negl.	25	Negl.
India	258	33	2,342	38
Indonesia	27	3	80	1
Iraq	11	1	100	2
Mali	Negl. <u>b/</u>	Negl.	0 <u>b/</u>	0
Nepal	3	Negl.	2	Negl.
Somali	2 <u>b/</u>	Negl.	0 <u>b/</u>	0
Syria	16	2	58	1
Tunisia	2	Negl.	2	Negl.
Turkey	1	Negl.	15	Negl.
United Arab Republic	294	38	2,378	39
Yemen	Negl.	Negl.	1	Negl.
Total <u>c/</u>	<u>775</u>	<u>100</u>	<u>6,124</u>	<u>100</u>

- a. Including credits extended by Poland to Brazil in an agreement signed in December 1962.
 b. Under survey only.
 c. Because of rounding, components may not add to the totals shown.

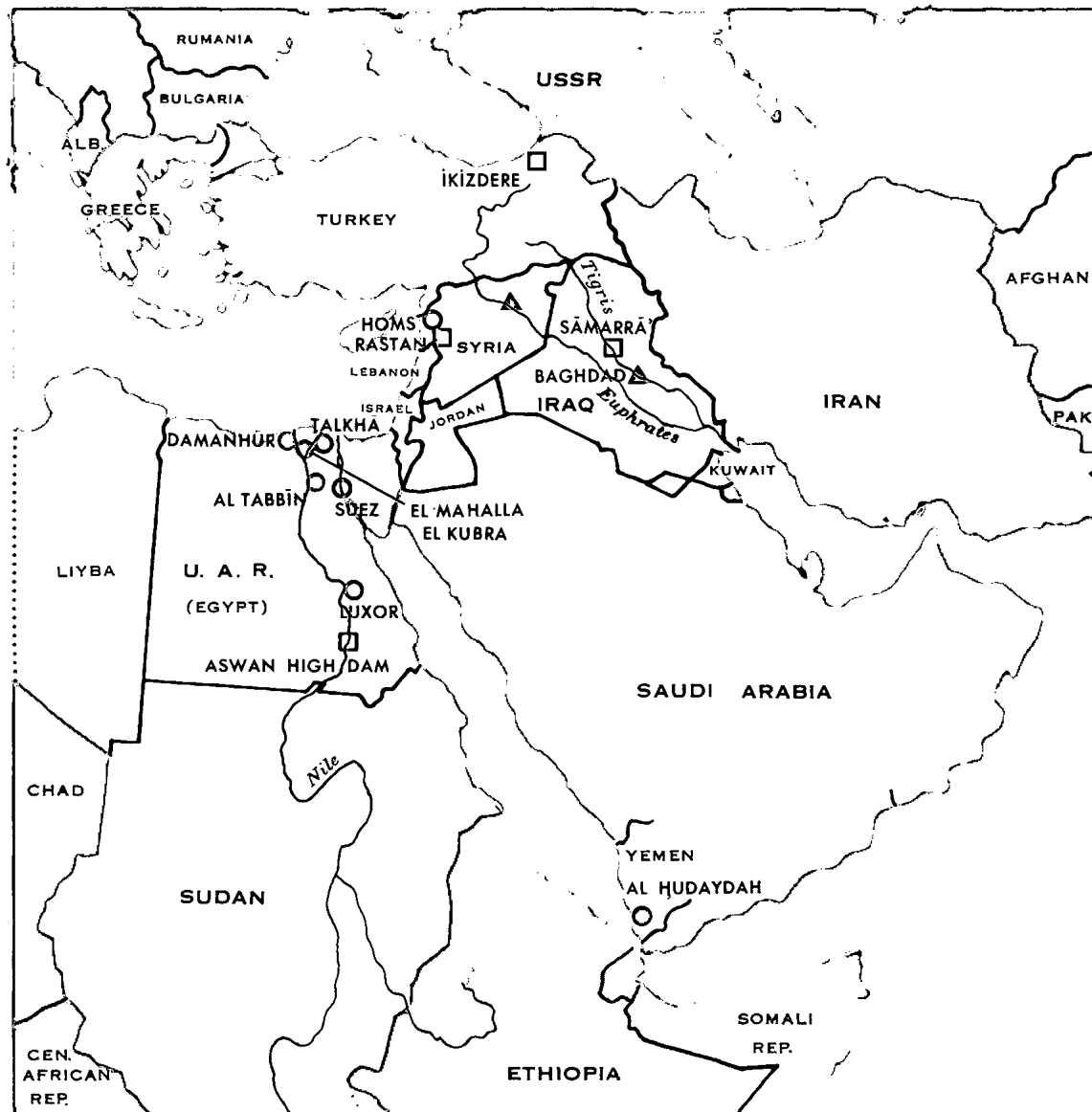
II. Use of Electric Power Aid to Pursue Goals of the Comprehensive Economic Aid Program for Underdeveloped Areas

The electric power aid program has served the Soviet Bloc as a means of entry into some underdeveloped areas and as a means of*

* Text continued on p. 7.

Figure 1 50X1

ELECTRIC POWER PROJECTS UNDERTAKEN WITH SOVIET BLOC AID IN THE MIDDLE EAST



THERMAL ELECTRIC	HYDROELECTRIC	
○	□	Completed
○	□	Under construction or planned
	△	Under survey



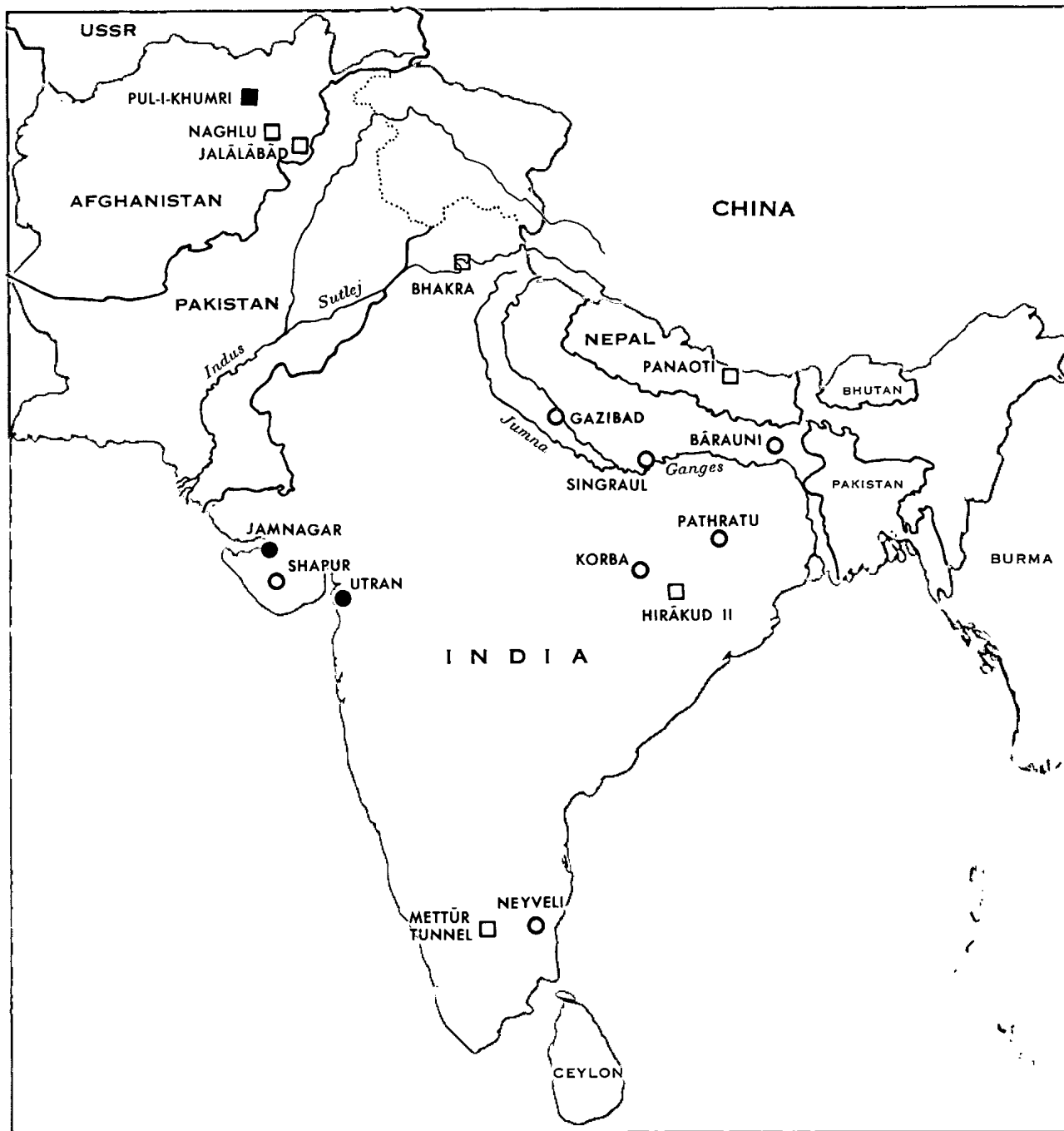
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Figure 2 50X1

ELECTRIC POWER PROJECTS UNDERTAKEN WITH SOVIET BLOC AID IN SOUTH ASIA

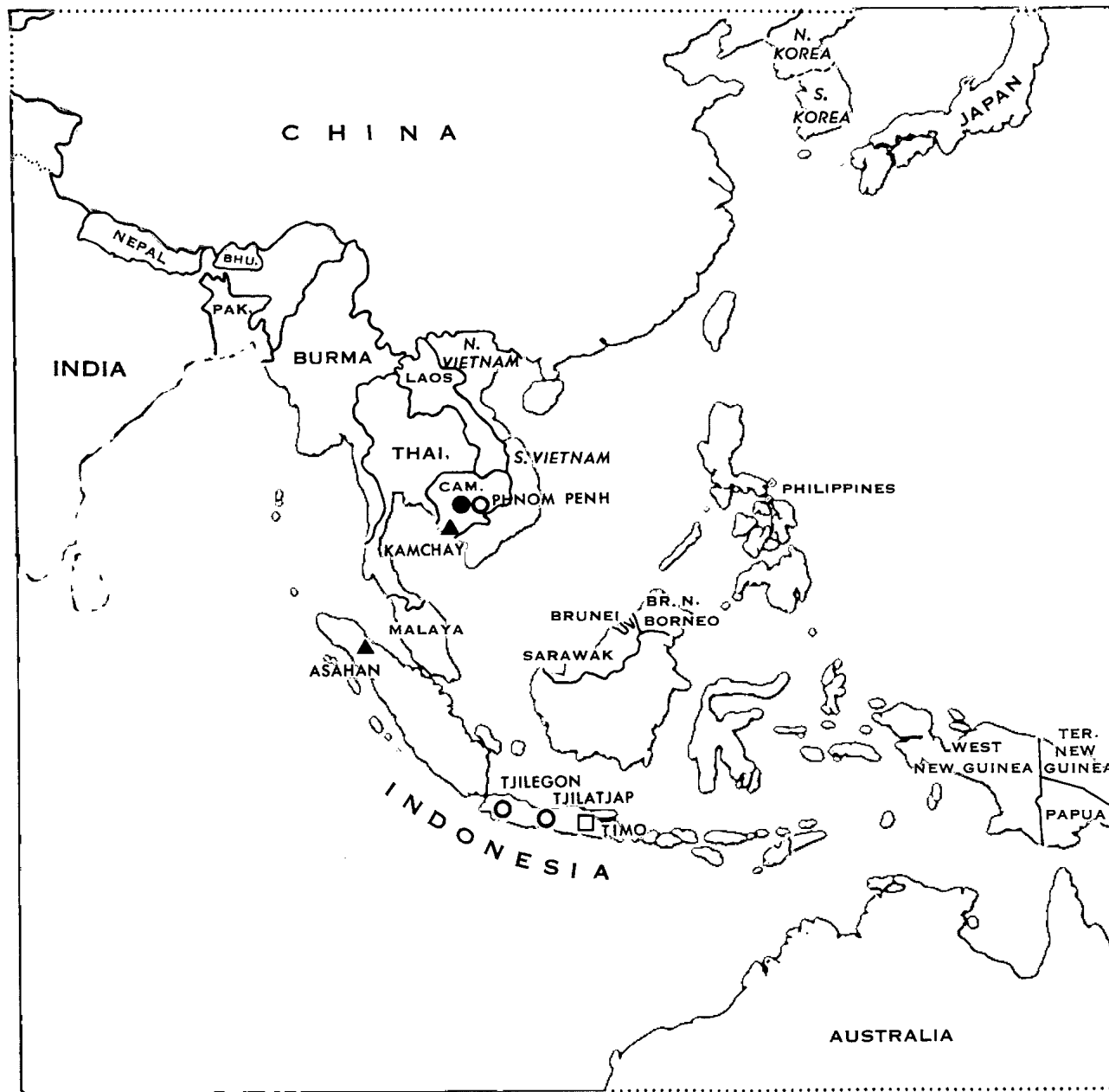


THERMAL ELECTRIC	HYDROELECTRIC	
●	■	Completed
○	□	Under construction or planned

50X1

Figure 3 50X1

ELECTRIC POWER PROJECTS UNDERTAKEN WITH SOVIET BLOC AID IN THE FAR EAST



THERMAL ELECTRIC	HYDROELECTRIC	
●		Completed
○	□	Under construction or planned
	▲	Under survey

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and declassification

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Figure 4 50X1

ELECTRIC POWER PROJECTS UNDERTAKEN WITH SOVIET BLOC AID IN AFRICA



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Figure 5

ELECTRIC POWER PROJECTS UNDERTAKEN WITH SOVIET BLOC AID IN LATIN AMERICA



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S-E-C-R-E-T

competing with Western powers for prestige and influence in other areas. The largest credits have been extended in areas where the Bloc is in strong competition with Western countries. The usual Soviet Bloc procedure is to negotiate with the country receiving aid a general agreement that stipulates the total amount of the line of credit to be made available, the credit terms, and sometimes the general types of projects to be undertaken. The actual implementation of the line of credit requires further negotiation and signing of protocols for detailed project agreements and, at a later stage, the signing of contracts for each project. This procedure furnishes numerous opportunities for propaganda at each stage of the negotiation long before work on the project has begun.

The Soviet government has offered and has highly publicized very favorable credit terms. By underbidding on project costs and offering better credit terms, Soviet officials have managed to obtain contracts for electric power projects that otherwise would have been awarded to Western countries. The usual interest rate charged by the USSR is 2.5 percent, with repayment extending over a period of 12 years from the completion of the project. In some cases, more favorable terms have been offered, as in the case of a \$100 million credit to Afghanistan, to be repaid over a period of 30 years. Repayment of these loans usually is specified to be in local currency or local goods. These long-term loans, while immediately advantageous to the recipient, afford Soviet Bloc countries a long-term advantage by keeping the recipient country tied to its creditor economically and financially for a prolonged period.

The largest single Soviet Bloc aid project is the construction of the Aswan High Dam and Hydroelectric Powerplant, with a capacity of 2,100 mw, in the UAR. Of the total Soviet loan of \$325 million for the project, it is estimated that \$250 million may be allocated to electric power and \$75 million to irrigation.* This single project represents 34 percent of the electric power capacity being built in underdeveloped countries with Soviet Bloc aid and 32 percent of the credits that have been extended for this purpose. The Soviet government moved into the vacuum left when the International Bank for

* There is no known contractual agreement on the Aswan project that allocates the cost of the dam and other multipurpose aspects of the project to electric power or irrigation. It has been estimated, on the basis of planning figures, that the foreign exchange required for power facilities will be \$200 million; for irrigation facilities, \$60 million; and for multipurpose aspects, including construction of the dam and powerhouse, \$180 million. 1/ [redacted]

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[redacted] If it is assumed that the Soviet credits of \$325 million for the Aswan project should be allocated in the same manner as the foreign exchange requirements for power and irrigation, then \$250 million of the Soviet credits are for power development and \$75 million for irrigation.

S-E-C-R-E-T

S-E-C-R-E-T

Reconstruction and Development broke off negotiations to finance the Aswan High Dam in 1956. A contract was signed in 1958 providing for Soviet aid in the construction of the High Dam. The colossal size of the project, its importance to the UAR, and the publicity that it had already received offered the USSR an opportunity to make this a major propaganda showpiece of Soviet generosity and technical competence.

The most extensive Soviet Bloc aid program in terms of the number of plants and integration of Bloc assistance with the program for general economic development has been undertaken in India. The Western powers, especially the US, had already embarked on extensive programs of aid to India in its First and Second Five Year Plans (1951-61) and were offering major economic assistance for the Third Five Year Plan (1961-66). The nearness of India to the USSR and Nehru's influence as a statesman made it highly desirable for the USSR to attempt to offset Western influence by offering an aid program of its own. India's planned industrial expansion demanded an increase of 7,000 mw in electric power capacity during the Third Five Year Plan. Soviet Bloc technicians presented and India accepted offers for the construction of 10 powerplants with a total capacity of approximately 2,300 mw, or 33 percent of the total capacity to be installed during the plan. Soviet Bloc plans include construction of the two largest thermal electric powerplants to be built in India.

In the new republics of Africa the offering of economic assistance for development has served as an opening wedge for Soviet Bloc influence. In Ghana, Guinea, Mali, and Somali, Soviet engineers are making surveys for large hydroelectric projects. These surveys provide an opportunity for sending large numbers of Soviet technicians into the countryside. In Ghana, for instance, the Soviet officials had planned to send 66 engineers to carry out the survey, but at the insistence of the Ghana government the number was reduced to 44.

In some areas the Soviet planners have pushed projects that if carried out would eclipse and reduce the usefulness of projects already under construction (or well along in the planning stage) with Western assistance. The best example of this technique is the Bui hydroelectric project on the Black Volta River in Ghana. The Bui project was considered to be the third stage of the over-all Volta River scheme. The first stage was to be the Akosombo project, which was to be financed by the International Bank and built by Western engineers. The final agreement for the Akosombo project was about to be signed at the end of 1960, when the Soviet mission proposed the Bui project. It was felt by many that the Bui project was designed purely to sabotage the Akosombo project, as there was no economic justification for the Bui project. The investment per kilowatt for Bui would be almost double that of Akosombo,

S-E-C-R-E-T

and there would be no market for the power from Bui if the Akosombo project were completed. 2/ Nevertheless, the contract was signed for Soviet technicians to proceed with the survey and technical planning. A work camp is now under construction at the Bui Dam site to accommodate the Soviet engineers and 200 Ghanaians who will be engaged in this operation. In the meantime, the contract providing for construction of the Akosombo project by Western engineers was signed and construction got underway in 1961.

III. Soviet Bloc Electric Power Aid Programs

A. Soviet Program

The USSR has extended an estimated total of \$614 million in aid to underdeveloped countries for electric power projects, an amount that is 18 percent of the total Soviet aid to these countries and 79 percent of the total Bloc aid to underdeveloped countries in the field of electric power. Underdeveloped countries are receiving aid from the USSR in the construction of 21 powerplants with a total capacity of 4,663 mw. This amount is 76 percent of the total capacity being installed in underdeveloped countries, 23 percent of the approximately 20,000 mw of powerplant capacity that the USSR is committed to build for foreign countries, and 7 percent of the 65,000 mw of capacity being built by the USSR at home and abroad. 3/ The other 15,000 mw of capacity being built abroad is committed to Bloc countries.

The 21 powerplants have been or are being built in the following countries: Afghanistan, Cuba, Egypt, India, Indonesia, Nepal, Syria, Tunisia, and Yemen. (See the accompanying photograph of the 9-mw hydroelectric powerplant at Pul-i-Khumri, Afghanistan -- the first powerplant to be completed in an underdeveloped country with Soviet aid.)



- 9 -

S-E-C-R-E-T

S-E-C-R-E-T

In addition to the powerplants that are under construction, technical surveys for major hydroelectric projects have been undertaken in Cambodia, Indonesia, Syria, Iraq, Ghana, Guinea, Mali, and Somali. If these surveys lead to construction of powerplants, a considerable addition to the financial and technical aid extended by the USSR in the field of electric power would be required. The amount of aid being extended by the USSR to each of the recipient countries is shown in Table 3.*

About 87 percent of the aid extended by the USSR to underdeveloped countries for electric power development is concentrated in three countries -- the UAR, India, and Cuba.

1. UAR

The UAR is the recipient of the largest amount of assistance -- 42 percent of the aid that the USSR is supplying for electric power projects -- the bulk of this aid being for the Aswan High Dam and Hydroelectric Powerplant. Soviet economic penetration of the UAR began in 1955 when the USSR began to make efforts to obtain the contract for construction of the High Dam at Aswan. In 1958 a contract was signed providing for Soviet aid in the first phase of the High Dam, which included the construction of two cofferdams, a system of communications and roads in the Aswan area, a canal, and other local facilities. Construction of the first phase began in January 1960, and in October 1960 the contract for the second phase of the project was signed. The second phase includes the construction of the High Dam, a hydroelectric powerplant with a capacity of 2,100 mw, two transmission lines to carry the current from Aswan to Cairo, and a power network from Cairo to other locations in lower Egypt. The powerplant will have twelve 175-mw hydrogenerators that will be larger than any others in operation outside the USSR. The powerplant itself will be of the same general size as the hydroelectric powerplants at Kuybyshev and Volgograd in the USSR.

Progress on the first phase of the High Dam project has been behind schedule because of the poor quality of some of the Soviet construction equipment, delays in receiving equipment, administrative inefficiency on the part of the Egyptians, and disagreements on details by Soviet and Egyptian officials. Soviet drilling equipment was found to be so inadequate for drilling rock on the dam site that it was replaced early this year by Swedish drills, at the insistence of an Egyptian contractor. ^{4/} Officials of the UAR Electricity Commission recently asked for quotations on generating equipment for the powerplant from Westinghouse Electric International, although Soviet designers have completed the technical specifications for the equipment. ^{5/}

* Table 3 follows on p. 11.

S-E-C-R-E-T

Table 3

Estimated Soviet Bloc Financial Aid to Underdeveloped Countries
 in the Field of Electric Power
 as of 1 July 1962

		Million Current US \$	
<u>Bloc Country</u>	<u>Recipient</u>	<u>Estimated Electric Power Aid a/</u>	<u>Electric Power Aid Estimated as a Percent of Total Aid</u>
USSR	Afghanistan	26.1	5
	Cambodia	1.0 b/	14
	Cuba	40	13
	Ghana	5 b/	5
	Guinea	5 b/	7
	India	235.1	29
	Indonesia	18.5	5
	Iraq	2.5 b/	1
	Mali	0.2 b/	Negl.
	Nepal	2.8	27
	Somali	2 b/	3
	Syria	12.7	8
	Tunisia	2	7
	UAR	261	51
	Yemen	0.5	2
	Total	<u>614.4</u>	18
Czechoslovakia	Argentina c/	7	65
	Brazil c/	10.2	87
	Cambodia	3.8	45
	Cuba	31	78
	Ghana	3 b/	12
	Iceland	1.5	100
	India	6	6
	Indonesia	8.7	14
	Iraq	8.4	25
	Syria c/	3.8	15
	UAR	20.8	21
		Total	<u>104.2</u>

S-E-C-R-E-T

S-E-C-R-E-T

Table 3

Estimated Soviet Bloc Financial Aid to Underdeveloped Countries
in the Field of Electric Power
as of 1 July 1962
(Continued)

		Million Current US \$	
<u>Bloc Country</u>	<u>Recipient</u>	<u>Estimated Electric Power Aid ^{a/}</u>	<u>Electric Power Aid Estimated as a Percent of Total Aid</u>
Poland	Brazil ^{d/}	26.0	36
	India	17.3	58
	Total	<u>43.3</u>	16
East Germany	UAR	6.2	17
	Total	<u>6.2</u>	9
Hungary	Turkey	1	91
	UAR	5.7	25
	Total	<u>6.7</u>	8
	Grand total	<u>774.8</u>	17

- a. From Appendix A.
b. Under survey only.
c. Including a few commercial agreements that may not be considered aid in the form of long-term credits.
d. Including credits extended by Poland to Brazil in an agreement signed in December 1962.

Construction of the hydroelectric plant also is to begin in 1962, with initial production scheduled for 1967 and full capacity to be reached in 1970. ^{6/} In June 1962, Soviet officials recalled the Soviet director of the project and replaced him with the top Soviet engineer in the field of hydroelectric construction, Alexander Alexandrov, ^{7/} who supervised the construction of the Volgograd Hydroelectric Powerplant, at present the largest hydroelectric powerplant in the world. The Soviet government also has shipped additional specialized equipment to Egypt and has doubled the cadre of Soviet engineers

- 12 -

S-E-C-R-E-T

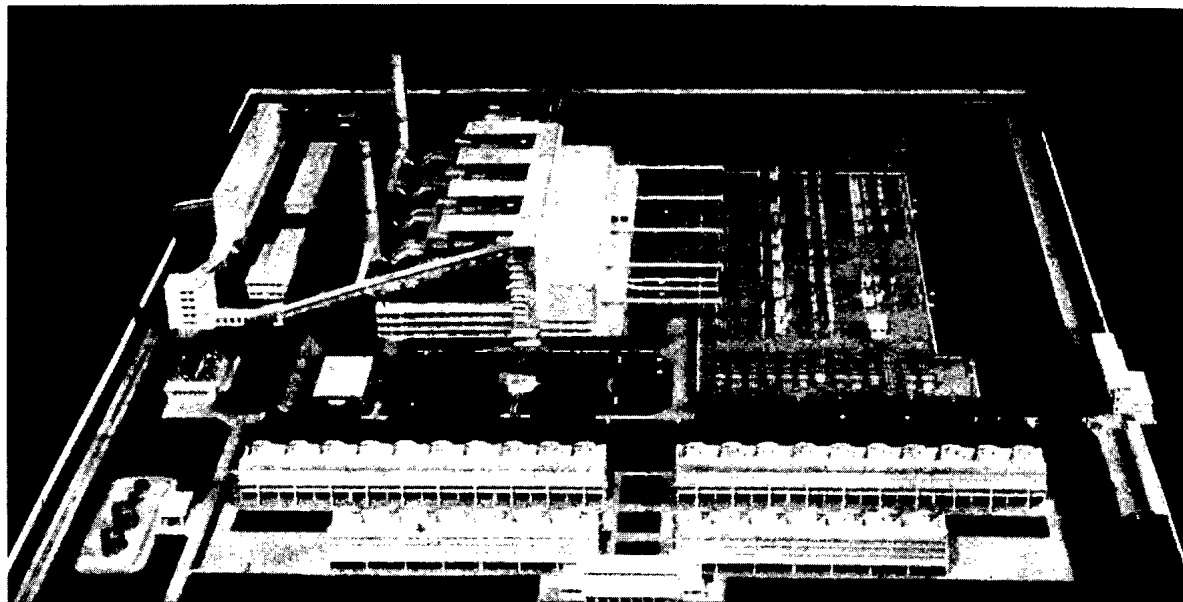
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and technicians. To match these Soviet moves, Egypt has placed its army officers, technicians, and engineers at the disposal of the High Dam Authority. 8/ The added inputs of managerial and technical competence, labor, and equipment may be sufficient to get the project back on schedule.

In addition to the Aswan project, the USSR has agreed to assist in the construction of another powerplant in the UAR. In 1958 a contract was concluded for construction of a thermal electric powerplant at Suez that is to furnish power to the oil refinery and to the city of Suez. Three 25-mw units for this project were to have been shipped during 1961 and 1962, but shipments are behind schedule. 9/

2. India

India is the recipient of the second largest amount of Soviet aid, being exceeded only by the UAR. The USSR has contracted to aid in the construction of seven powerplants in India, which account for 38 percent of the total credits extended by the USSR for aid on electric power projects. The first power project to be started in India with Soviet assistance was the Neyveli Thermal Electric Powerplant, in Madras State (see the accompanying photograph of a model of the first phase -- 250 mw -- of this installation). The powerplant is



- 13 -

S-E-C-R-E-T

S-E-C-R-E-T

part of the comprehensive Neyveli lignite project, which is to include coal mines, a fertilizer plant, and other enterprises. The first 50-mw unit went into operation in August 1962, about a year behind schedule. It is planned to reach its full capacity of 400 mw by the end of 1965.

Three other large thermal electric powerplants are to be constructed in India with Soviet assistance. These are the Pathratu Thermal Electric Powerplant, in Bihar State, which will meet the power requirements of the Soviet-aided heavy machine building plant and the Czechoslovak-aided foundry-forge plant; the Korba Thermal Electric Powerplant, which will supply power to the Soviet-aided Bhilai steel plant as well as the Korba coal mines and iron ore mines in the area; and the Singraul Thermal Electric Powerplant, which will supply the power needs of industry in Uttar Pradesh State. The four thermal electric powerplants being built by the USSR, together with a thermal electric powerplant being built by Poland, will be the largest in India. They are scheduled for completion by April 1966, but the Indian government was informed recently that the USSR will be able to supply only about half of the equipment within the scheduled time. 10/ This situation brought strong protests from Indian officials and was the subject of a discussion with Soviet Deputy Premier Mikoyan on his brief visit to India in July 1962.

In addition to thermal electric powerplants, Soviet aid is helping to construct three hydroelectric powerplants: the Bhakra River Right Bank Hydroelectric Powerplant, the Mettur Tunnel Hydroelectric Powerplant, and the Hirakud II Hydroelectric Powerplant. The total capacity of these three hydroelectric powerplants, all of which are scheduled to be completed by April 1966, is 782 mw. The USSR changed the original plans of the Bhakra Right Bank plant so that the capacity would be greater than the Left Bank plant, which is to be completed this year with aid from the US and Japan. 11/

3. Cuba

Cuba is the only Latin American country thus far that has accepted assistance from the USSR in the field of electric power. The assistance program in Cuba is being shared almost equally by the USSR and Czechoslovakia. The USSR has extended about \$40 million in credits 12/ to aid in constructing two large thermal electric powerplants at Mariel and Santiago, with a total capacity of 300 mw, and a small 12-mw powerplant at the Antillana de Acero Steel Plant in Havana. The Santiago plant probably will be completed in 1965, and the Mariel plant will begin operation in 1965 but will not be completed until after 1966.

- 14 -

S-E-C-R-E-T

S-E-C-R-E-T

In addition to the assistance given to the UAR, India, and Cuba, the USSR has extended small amounts of aid for the development of electric power in countries of Asia, the Middle East, and Africa.*

B. European Satellite Programs

The European Satellites have extended credits of \$160 million to underdeveloped countries to aid in the construction of electric powerplants, thus accounting for about 17 percent of the total Satellite aid effort. The total capacity to be installed in powerplants built with Satellite aid is 1,461 mw, equal to 24 percent of the total capacity being installed with Soviet Bloc aid. Loans offered by European Satellites initially carried higher interest rates and required repayment within a shorter period than did those offered by the USSR. They have gradually been brought into closer alignment with Soviet loans, however, in order to compete in bidding for contracts.

Among the European Satellites, Czechoslovakia has the greatest economic and technical ability to offer assistance to underdeveloped countries and consequently has obligated itself most heavily for construction of powerplants and delivery of equipment. Of the credits extended to these areas, the Czechoslovak government is estimated to have obligated \$104 million, or about 21 percent of the total Czechoslovak aid, for electric power facilities.** The assistance coming from Czechoslovakia is principally in the form of equipment for powerplants, as only limited technical assistance has been given. The total electric power capacity that Czechoslovakia has contracted to supply to underdeveloped countries at present is approximately 921 mw. Compared with the programs offered by the USSR and Czechoslovakia, those of Poland, Hungary, and East Germany are insignificant, comprising together only 7 percent of the total Bloc credits extended for electric power aid to underdeveloped countries.

In spite of the greater publicity given Soviet aid to underdeveloped countries in the field of electric power, Czechoslovakia, Hungary, and East Germany each placed one or more powerplants in operation in underdeveloped areas before the USSR did so. Czechoslovakia became the first Soviet Bloc country to complete a powerplant project in an underdeveloped country when a small powerplant was put into operation in India as scheduled in 1957. Hungary and East Germany completed thermal electric powerplants for Egypt a year behind the scheduled 1959 opening but well ahead of the completion in May 1962 of the hydroelectric powerplant at Pul-i-Khumri, Afghanistan.

* For details concerning these smaller aid projects, see Appendix A.

** For the amount of aid extended by individual countries of the Soviet Bloc, see Table 3, p. 11, above.

S-E-C-R-E-T

Czechoslovakia's most extensive aid program in the field of electric power is being conducted in Cuba, for which \$31 million in credits have been extended. Czechoslovakia plans to construct two thermal electric powerplants, one at Nuevitas and one at Punta Martillo, with a total capacity of 150 mw; to expand three additional thermal electric powerplants by a total of 180 mw; and to add a 14-mw unit to an existing hydroelectric powerplant. 13/ The aid program probably will extend well past the planned completion date of 1965, as none of the planned additions to capacity has been started.

Czechoslovakia's second largest electric power aid program is in the UAR. Credits amounting to \$20.8 million have been extended to the UAR for construction of three thermal electric powerplants, totaling 93 mw, and for 69 diesel generating sets totaling 35 mw in capacity. A powerplant at El Mahalla el Kubra was completed in 1960, and a small powerplant at the sugar mill near Luxor was completed in 1961. The Talkha Thermal Electric Powerplant, originally built by Westinghouse International, is being expanded by 60 mw and is to be in operation by 1964. The contract for the diesel generating sets was signed in 1961, and the generators were scheduled to begin operating in 1962.

Satellite activity in extending aid to Latin American countries other than Cuba is increasing. Czechoslovakia has contracted to supply electric power equipment worth \$17 million to Argentina and Brazil and recently has offered free assistance to Bolivia in developing its hydroelectric resources. The offer to Bolivia includes surveys, drawing up of plans and technical studies, undertaking of initial construction work on dams, and exploration for local construction materials. 14/ Czechoslovakia usually does not offer free assistance and probably extended this offer merely as a means of gaining a foothold in Bolivia. It is likely that only limited technical assistance will be provided if the offer is accepted. Poland signed an agreement with Brazil on 1 December 1962, according to which it is to provide \$26 million in credits for the construction of a 200-mw thermal electric powerplant in the state of Rio Grande do Sul, with construction to begin in about 6 months. 15/

In addition to assistance given the UAR and Latin American countries, the European Satellites have extended smaller amounts of aid for electric power projects in India, Cambodia, Indonesia, Iraq, Syria, Turkey, Iceland, and Ghana.*

C. Effects of Aid Projects on Recipient Countries

The recipient countries of the Bloc aid projects are industrially underdeveloped and have a very low degree of electrification. The new

* For details concerning individual aid projects, see Appendix A.

S-E-C-R-E-T

industries that are now being developed will require a great expansion of electric power facilities. The powerplants that are being built with aid from Bloc countries in many cases will supply power directly to other industrial projects that are being built with Bloc aid. This is particularly true in India, where five large thermal electric powerplants are being built by the USSR and Poland to supply power for a steel plant; an oil refinery; a heavy machine building plant; a foundry-forge plant; coal mines; a chemical plant; and other enterprises, all being built with Bloc aid.

Cuba has become more dependent on Soviet Bloc assistance than has any other country. Aid from Bloc countries will be essential to offset the deterioration in Cuba's present power industry, which is largely dependent on the availability of parts from the West. New capacity will be necessary to support any further economic growth, such as the steel mill and oil refinery to be built at Santiago. The new capacity also will be used to bolster the existing power system, giving it a greater degree of reliability and enabling the older equipment to be used to cover peak loads and as a reserve.

The Aswan High Dam and Hydroelectric Powerplant in the UAR probably will have the greatest effect on the local economy of any of the Bloc power projects. Most of the cultivated land in the UAR is dependent on irrigation. The dam will make it possible to irrigate a million additional acres of land and also will control the floods in the Nile Valley. The hydroelectric powerplant, which will almost triple the UAR's supply of electric power, will furnish power for pumping stations along the irrigation canals and will open up opportunities for a great expansion of industry in the UAR.

Surveys are being conducted by Soviet Bloc technicians in a number of countries to select sites for hydroelectric projects. Some of these projects are tied in with planned development of major industrial projects, such as an aluminum plant in Indonesia, a ferromanganese plant in Ghana, and an aluminum plant in Guinea.

The importance of Bloc aid as a means of increasing the capacity of the electric power industries of the underdeveloped countries is illustrated by the fact that additions to capacity to be accomplished with Bloc aid will increase the installed capacity of the UAR by 203 percent, will increase the capacity of Afghanistan by 178 percent, and will constitute substantial increases in the capacity of a number of other countries. Capacity constructed with Bloc aid is to account for 91 percent of planned increases in capacity in Cuba, 87 percent in Afghanistan, 33 percent in India, and 25 percent in Indonesia. For a comparison of the capacity to be added by Bloc aid projects with existing capacities and with planned expansion of capacity in underdeveloped countries, see Table 4.*

* Table 4 follows on p. 18.

Table 4

Soviet Bloc Aid Related to Total Installed and Planned Generating Capacity
in Underdeveloped Countries

Recipient Country	Installed Capacity at End of 1960 (Megawatts)	Total Planned Increase	Planned Increase in Capacity from Bloc Aid		
			Total Planned Increase (Megawatts)	As a Percent of Installed Capacity at End of 1960	As a Percent of Total Planned Increase
Afghanistan	45 a/	92 a/	80	178	87
Argentina	3,010 b/	N.A.	50	2	N.A.
Brazil	4,555 b/	N.A.	314	7	N.A.
Cambodia	66 c/	N.A.	21 d/	32	N.A.
Cuba	850 b/	724	656	77	91
Iceland	155 b/	N.A.	25	16	N.A.
India	5,700 e/	7,000 c/	2,342	41	33
Indonesia	400 b/	325	80 d/	20	25
Iraq	275 b/	N.A.	100 d/	36	N.A.
Nepal	7 f/	35	2	29	6
Syria	140 b/	N.A.	58 d/	41	N.A.
Tunisia	146 b/	N.A.	2	1	N.A.
Turkey	1,332 b/	N.A.	15	1	N.A.
UAR	1,169 b/	N.A.	2,378	203	N.A.
Yemen	N.A.	N.A.	1	N.A.	N.A.
Total	17,850		6,124	34	

a. 16/
b. 17/
c. 18/

d. Additional hydroelectric surveys are being made.
e. 19/
f. 20/

S-E-C-R-E-T

IV. Problems and Prospects

A. Problems

Both Bloc donors and underdeveloped recipient countries have met with many problems in the process of carrying out the terms of aid agreements in the field of electric power. These problems can be attributed basically to the fact that, although the governments of the Soviet Bloc are providing plans, equipment, technical supervision, and foreign exchange credits, the local government is responsible for administrative supervision of construction and installation work, for providing local labor and supplies, and for obtaining the funds to cover these local costs. As most of the Bloc aid projects in the field of electric power are still in the early stages of construction, problems arising from local shortcomings in furnishing funds, labor, materials, and management have been of great importance.

The local financing that must be provided by the recipient country may amount to as much as 50 percent of the cost of a powerplant. As a consequence, the lack of local funds has delayed the construction of a number of electric power projects. In the case of both Afghanistan and Nepal, the Soviet government offered to ship consumer goods for resale in the recipient country, chargeable to the Soviet line of credit, to permit the local government to raise the necessary funds. The governments of Afghanistan and Nepal had doubts that the local consumer goods markets could absorb Soviet goods in sufficient quantities to raise the necessary funds and thus were reluctant to accept the proposal, but they had no alternative means of raising the funds 21/ and therefore agreed.

Outmoded or inappropriate construction equipment, inferior construction materials, and the lack of skilled labor in most underdeveloped countries have been additional factors retarding progress in the construction of powerplants. Soviet engineers have had difficulties in training local workers and in obtaining an adequate labor force to maintain the construction schedules. Further problems are involved in training local engineers to operate the powerplants when construction is completed.

Dissatisfaction with the slow progress on the Asahan project and the limited responsibility that the USSR will assume for carrying out a project has led the Indonesian government as well as other countries to urge the USSR to undertake aid projects on a turnkey basis, as the US has done. The Soviet refusal to do so has been the cause of a basic disagreement between Soviet and Indonesian officials.

As the aid projects progress to the stage in which equipment will have to be furnished in greater amounts, there is every indication

S-E-C-R-E-T

S-E-C-R-E-T

that delays in shipment, incomplete shipments, and faulty operation of equipment will become more of a problem. Such difficulties have already been noted in connection with the Soviet program in the UAR and India.* The East Germans in their construction of the Damanhur Powerplant in Egypt exceeded the costs originally agreed on by almost \$3 million as a result of delays, haphazard planning, and mismanagement. 22/ The East Germans also lost a pending contract to supply equipment for the Alexandria Powerplant and recently have had to default on a new contract to expand the Damanhur Powerplant because of lack of equipment. 23/ Hungary also experienced difficulty in getting the Al Tabbin Thermal Electric Powerplant in the UAR into operation in 1960, largely because of the poor quality of Hungarian equipment installed and problems in training Egyptian personnel. 24/

B. Prospects

Up to this point, the powerplant construction program of the Soviet Bloc in underdeveloped countries has been limited largely to the planning and initiation of projects. The program has now reached a stage, however, in which sizable shipments of equipment to recipient countries must be scheduled and coordinated with plans for production of equipment, for domestic construction of powerplants, and for export of equipment to other Communist countries. The Bloc countries that have contracts for future shipments of equipment to underdeveloped countries are Czechoslovakia, Poland, and the USSR.

Czechoslovakia generally has been able to maintain its schedule and as of late 1962 had built 5 of the 11 powerplants put into operation in underdeveloped countries by the Bloc. Its heavy equipment industry is capable of producing good-quality electric generating equipment and has maintained a high level of exports, to some extent at the expense of the domestic electric power industry. The installation of new generating equipment in Czechoslovakia has been falling behind schedule. Much of the existing equipment is old, is being operated at excessively high rates of utilization, and is in frequent need of repairs. Plants capable of constructing additional generating equipment, however, are at present committed to produce other types of heavy equipment, some of which -- such as diesel and diesel-electric locomotives, mining and construction equipment, and heavy machine tools -- also enjoy high priorities for export. Consequently, any move to increase the availability of electric generating equipment, either for expansion of domestic capacity or for export to underdeveloped areas, would involve substantial revision of existing priorities.

* See III, A, p. 9, above.

S-E-C-R-E-T

In Poland, requirements for generating equipment are approximately in balance with the capacity for manufacturing such equipment. Some disruption of scheduled production for domestic use may be necessary to permit production of equipment for powerplants in India and Brazil.

Most of the contracts for aid projects that the Soviet government has signed were not included in the Soviet Seven Year Plan (1959-65). Soviet capacity for production of generating equipment was so fully committed by Bloc plans that there was not much leeway for making additional equipment available to the underdeveloped countries. Consequently, schedules for shipping power generating equipment are beginning to be disrupted, with resulting bottlenecks and unfulfilled promises of delivery to recipient countries. Although some domestic programs may be stretched out to enable key aid projects to be completed on time, it is believed that, in general, domestic commitments will be given priority and that the aid program will not be permitted to hinder the growth of the Soviet electric power industry. The chances of success of the aid program in underdeveloped countries have been improved greatly by the fact that shipments of power generating equipment to Communist China over the next 5 years probably will be about 6,000 mw less than originally planned.*

As a result of a sharp reduction in shipments to Communist China since 1960, exports of power generating equipment from the USSR decreased somewhat, from 1,500 mw in 1959 and 1,400 mw in 1960 25/ to 1,200 mw planned for 1962. 26/ As a result of the reduction in shipments to China, original commitments to underdeveloped countries (which would have been hopelessly beyond the capabilities of the Soviet power equipment industry) may be fulfilled with only a 2-year or 3-year stretch-out in commissioning dates.

The planned destinations of Soviet exports may change from year to year as a result of changing priorities. Shipments to Cuba of six 50-mw units necessary for the construction of two thermal electric powerplants provided for in contracts concluded with Cuba within the past year undoubtedly have a high priority. There now is evidence that shipments of thermal electric generators to China are being increased but are still at substantially lower levels than originally planned in 1957-58. These rescheduled shipments to China also may be receiving a high priority. Hence the shift in priorities for scheduled shipments to Cuba and China could have necessitated the cutting back of planned shipments to India. 27/ This change probably is the reason that Soviet officials informed India

* It is estimated that 8,000 to 9,000 mw of the 15,000 mw committed by the USSR to Bloc countries were allocated to Communist China. The industrial stagnation in China, however, probably will enable Soviet shipments to China to be cut to no more than 2,000 to 3,000 mw during the next 5 years.

S-E-C-R-E-T

that scheduled shipments of equipment would have to be cut in half and also explains Mikoyan's later statement to Indian officials that he would investigate the possibility of diverting thermal electric power equipment to India from Soviet internal projects. 28/ It is estimated, however, that the planned goals for installation of generating equipment in the USSR are far greater than the capacity that will actually be needed for the electric power production required and are greater than the capacity that actually will be installed. Therefore, a cut-back in the planned program for domestic installation of equipment would work no real hardship in the Soviet economy. It may become apparent to Soviet planners in the next few years that they need not have cut commitments to India as much as was believed to be necessary at first, but by that time it will be too late to meet the original schedule. Consequently, the original commitments to India probably will be met but after considerable loss of valuable time. The problem of allocating priorities for generating equipment probably will continue for some years before production of generating equipment will exceed internal requirements sufficiently to remove the need for tight scheduling.

- 22 -

S-E-C-R-E-T

S-E-C-R-E-T

APPENDIX A

ELECTRIC POWER PROJECTS IN UNDERDEVELOPED COUNTRIES
UNDERTAKEN WITH SOVIET BLOC AID
AS OF 1 JULY 1962

Recipient Country	Name or Location of Powerplant	Type	Capacity (Megawatts)	Soviet Bloc Aid		Status and Purpose
				Supplier	Amount (Million Current US \$)	
Afghanistan	Pul-i-Khumri	Hydroelectric	9	USSR	4.1	Completed in May 1962. To supply a cement plant and a textile plant. This was the first powerplant completed with Soviet aid in an underdeveloped country.
	Naghlu	Hydroelectric	60	USSR	19	To be completed in 1965. To supply expanding industry and municipal needs in the city of Kabul.
	Jalalabad	Hydroelectric	11	USSR	3	Completion planned for the end of 1963. Behind schedule. To provide current for pumping stations of irrigation system and the city of Jalalabad.
	Total		<u>80</u>		<u>26.1</u>	
Argentina	Rio Turbio	Thermal electric	24	Czechoslovakia	3 a/*	Completion planned for 1961, but the plant was not yet finished in 1962. To provide power for the coal industry.
	Llavallo	Thermal electric	13 a/	Czechoslovakia	2 b/	Equipment shipped in 1960. To supply a military armaments plant.

* Footnotes follow on p. 33.

S-E-C-R-E-T

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S-E-C-R-E-T

Recipient Country	Name or Location of Powerplant	Type	Capacity (Megawatts)	Soviet Bloc Aid		Status and Purpose
				Supplier	Amount (Million Current US \$)	
Argentina (Continued)	San Luis Province	Thermal electric	13 <u>a/</u>	Czechoslovakia	2 <u>b/</u>	Equipment shipped in 1960. To provide power for the oilfields.
	Total		<u>50</u>		<u>7</u>	
Brazil	Bariri, Rio Tiete, Sao Paulo State	Hydroelectric	90	Czechoslovakia	7.2 <u>b/</u>	To go into operation in 1963. To provide power for the general supply. Czechoslovakia is to furnish two 45-mw hydrogenerators and Brazil is to manufacture a third, using Czechoslovak plans.
	Porto Alegre, Rio Grande do Sul State	Hydroelectric	24	Czechoslovakia	3 <u>a/</u>	
	Ijuí, Rio Grande do Sul State <u>c/</u>	Thermal electric	200	Poland	26.0	To provide power for the general supply.
	Total		<u>314</u>		<u>36.2</u>	
Cambodia	Phnom Penh	Thermal electric	3	Czechoslovakia	0.3	Completed in June 1960. Contains two 1.5-mw generators, one a gift from Czechoslovakia and the other purchased from Czechoslovakia. Supplies power to new hospital and radio station.
	Provincial plants	Thermal electric	0.4	Czechoslovakia	0.1	Two 180-kw generators were presented by Czechoslovakia to be installed in the provinces.
	Phnom Penh	Thermal electric	18	Czechoslovakia	3.4	Completion planned for the end of 1964.
	Kamchay, Kampot	Hydroelectric	Survey	USSR	1.0 <u>a/ d/</u>	Surveys being made for a 30-mw to 40-mw powerplant.
	Total		<u>21.4</u>		<u>4.8</u>	

S-E-C-R-E-T

Recipient Country	Name or Location of Powerplant	Type	Capacity (Megawatts)	Soviet Bloc Aid		Status and Purpose
				Supplier	Amount (Million Current US \$)	
Cuba	Mariel, Pinar del Rio Province	Thermal electric	200	USSR	24	Probably will go into operation at the end of 1964. To transmit power to Havana.
	Santiago, Oriente Province	Thermal electric	100	USSR	13	Probably will go into operation in 1965. To supply power to a new refinery and a steel plant.
	Antillana de Acero Steel Plant, Havana	Thermal electric	12	USSR	3	In the planning stage. To supply the steel plant.
	Nuevitas, Camaguey Province	Thermal electric	120	Czechoslovakia	31	In the planning stage. To have two 60-mw units.
	Tallapiedra, Havana	Thermal electric	60	Czechoslovakia		Expansion planned. Probably will be started soon. To have one 60-mw unit.
	O'Bourke Powerplant, Cienfuegos, Las Villas Province	Thermal electric	90	Czechoslovakia		Expansion planned. To have one 30-mw unit and one 60-mw unit. Construction probably will begin in 1963.
	Punta Martillo Plant, Manzanillo, Oriente Province	Thermal electric	30	Czechoslovakia		Preliminary plans underway. To have one 30-mw unit.
	Hanabanilla, Las Villas Province	Hydroelectric	14	Czechoslovakia		One additional unit to be installed by 1964, increasing the capacity of the plant to 42 mw.
	Camaguey or Santiago Plant, Camaguey or Oriente Province	Thermal electric	30	Czechoslovakia	An expansion by one 30-mw unit planned, probably one of these plants.	
	Total		656		71	

S-E-C-R-E-T

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S-E-C-R-E-T

Recipient Country	Name or Location of Powerplant	Type	Capacity (Megawatts)	Soviet Bloc Aid		Status and Purpose
				Supplier	Amount (Million Current US \$)	
Ghana	Bui Dam	Hydroelectric	Survey	USSR	5 <u>a/ d/</u>	Agreement signed in September 1961 for survey and design work only. Survey begun in mid-1962. Decision whether or not to go ahead with the project awaits the results of the survey. The project is based on the planned development of a ferromanganese industry. The powerplant would have a capacity of approximately 200 mw.
	Small Rivers	Hydroelectric	Survey	Czechoslovakia	3 <u>a/ d/</u>	Survey was completed at end of 1961, and two locations were recommended for construction of small hydroelectric powerplants. Detailed studies of these sites are now to be made.
	Total					8
Guinea	Konkoure River	Hydroelectric	Survey	USSR	5 <u>a/ d/</u>	Survey was completed in February 1962, and a design is being prepared for a 500-mw hydroelectric powerplant, based on the planned development of an aluminum industry. A contract for construction has not been signed.
	Total					5
Iceland	Five generating units	Hydroelectric	25 <u>a/</u>	Czechoslovakia	1.5	Contract awarded in 1956. The first three units had started operating in 1959.
	Total		25		1.5	
India	Neyveli, Madras State	Thermal electric	400	USSR	44	To contain six 50-mw units and one 100-mw unit. First unit went into operation in August 1962. To be completed by the end of 1965. To supply power to the Neyveli Lignite Project, including coal mines, a fertilizer plant, and other enterprises.

S-E-C-R-E-T

Recipient Country	Name or Location of Powerplant	Type	Capacity (Megawatts)	Soviet Bloc Aid		Status and Purpose
				Supplier	Amount (Million Current US \$)	
India (Continued)	Pathratu, Bihar State	Thermal electric	400	USSR	40	Construction work underway in 1961. Final contract was signed in September 1962. The first 100-mw section is to be completed early in 1964. To supply power to a heavy machine building plant and a foundry-forge plant.
	Korba, Madhya Pradesh State	Thermal electric	200	USSR	23.6	Contracts signed in August 1962. The first 50-mw unit was to be delivered to India by the end of 1962. To supply power to the Bhilai Steel Plant, the Korba coal mines, and iron ore mines.
	Singraul, Uttar Pradesh State	Thermal electric	250	USSR	29	Agreement signed in February 1960. The first two 50-mw units are to go into operation in 1964. To supply power to industry in Uttar Pradesh State.
	Bhakra Right Bank, Punjab State	Hydroelectric	480	USSR	75 <u>a/</u>	Technical plans completed in mid-1962. The first unit is to go into operation in June 1965, with the other three to follow at 3-month intervals. To have four 120-mw units.
	Mettur Tunnel, Madras State	Hydroelectric	227	USSR	21.6	Construction work underway in 1960. The first two units were to be shipped to India in 1962 but will not be shipped until 1963; they are scheduled to go into operation in 1964. To have four 56.7-mw units.
	Hirakud II, Orissa State	Hydroelectric	75	USSR	1.9	USSR supplying equipment only. The first of three 25-mw units was being installed in mid-1962. To be completed during 1963-64.

S-E-C-R-E-T

Recipient Country	Name or Location of Powerplant	Type	Capacity (Megawatts)	Soviet Bloc Aid		Status and Purpose
				Supplier	Amount (Million Current US \$)	
India (Continued)	Barauni, Bihar State	Thermal electric	250	Poland	11	Contract signed in May 1962. The first section, consisting of two 50-mw units, is to be completed in 1963. To supply power to the Barauni refinery.
	Paras and Bhusaval	Thermal electric	0	Poland	6.3	Poland is to supply boilers for these two plants.
	Utran, Surat, Gujerat State	Thermal electric	45	Czechoslovakia	4 a/	Equipment was shipped in 1958, and the plant was completed in 1960. Has three 15-mw units.
	Shapur, Gujerat State	Thermal electric	10	Czechoslovakia	1 a/	Contract was signed in 1960. Equipment was to be shipped in 1961 but was not shipped until 1962.
	Jamnagar, Gujerat State	Thermal electric	0.5 a/	Czechoslovakia	0.5 a/	Completed in 1957.
	Gazibad, Uttar Pradesh State	Diesel	4.5	Czechoslovakia	0.5 a/	Equipment produced in 1961, to be shipped to India. To supply power for irrigation during the dry seasons.
	Total			<u>2,342</u>		<u>258.4</u>
Indonesia	Tjilegon	Thermal electric	36	USSR	10 a/	A heat and powerplant with three 12-mw units being built as part of the Tjilegon Steel Plant complex. Preliminary plan was completed in 1961. Should be completed by 1964.
	Tjilatjap	Thermal electric	12	USSR	3.5 a/	A heat and powerplant being built to serve the Tjilatjap superphosphate plant and the city of Tjilatjap. Should be completed by 1964.

S-E-C-R-E-T

Recipient Country	Name or Location of Powerplant	Type	Capacity (Megawatts)	Soviet Bloc Aid		Status and Purpose
				Supplier	Amount (Million Current US \$)	
Indonesia (Continued)	Sigura-gura, Asahan River	Hydroelectric	Survey	USSR	5 a/ d/	A survey being made for a hydroelectric plant, to be part of the large Asahan Project, which will include an aluminum plant scheduled to produce 70,000 tons of alumina and 18,000 tons of aluminum and a rolling mill with a capacity of 12,000 tons of rolled aluminum goods per year. First stage of the powerplant, 120 mw in three 40-mw units, probably will be started in 1966.
	Timo	Hydroelectric	12	Czechoslovakia	5.6	Contract was signed in 1958. Equipment was to be shipped in 1961.
	Tjurug	Hydroelectric	4 a/	Czechoslovakia	0.6	Agreement signed in 1960. It is not known whether construction has actually begun.
	48 generators	Diesel	16	Czechoslovakia	2.5	Deliveries were completed in 1962. Capacities of generators vary from 50 kw to 1,000 kw.
	Total		<u>80</u>		<u>27.2</u>	
Iraq	Tigris and Euphrates River Basin	Hydroelectric	Survey	USSR	2.5 d/	Survey began in 1962. If carried out, this project is estimated to cost \$150 million.
	Samarra Dam	Hydroelectric	100	Czechoslovakia	8.4	Preliminary survey completed, technical plans and specifications now being prepared. To have 25-mw units and to be completed in 1965. This plant will increase the total power capacity of Iraq by 24 percent and will be needed to meet Iraq's electric power requirements through 1967.
	Total		<u>100</u>		<u>10.9</u>	

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S-E-C-R-E-T

Recipient Country	Name or Location of Powerplant	Type	Capacity (Megawatts)	Soviet Bloc Aid		Status and Purpose
				Supplier	Amount (Million Current US \$)	
Mali	Sotouba, Niger River	Hydroelectric	Survey	USSR	0.2 <u>d/</u>	Preliminary survey requested in September 1961. No decision has been reached regarding the construction of the dam and powerplant.
	Total				<u>0.2</u>	
Nepal	Panaoti, Rosi River	Hydroelectric	2.4	USSR	2.8 <u>a/</u>	Plant and a 25-kilometer transmission line to Katmandu were planned for completion in 1962, but at the end of 1961 almost no work had been done because of numerous difficulties in starting the project. When completed, it will supply power to Katmandu, where the total electric power capacity available in 1961 was 4 mw.
	Total		<u>2.4</u>		<u>2.8</u>	
Somali	Giuba River	Hydroelectric	Survey	USSR	2 <u>a/ d/</u>	Survey being made for a planned 25-mw plant.
	Total				<u>2</u>	
Syria	Rastan Dam	Hydroelectric	10.5	USSR	8.7	Plans for the dam and hydroelectric plant were prepared by Soviet technicians. A construction contract was awarded to Bulgaria under the USSR-Syria aid agreement. Soviet engineers reportedly were brought in to assist, and the equipment was supplied from the USSR. Went into operation in August 1961.

S-E-C-R-E-T

Recipient Country	Name or Location of Powerplant	Type	Capacity (Megawatts)	Soviet Bloc Aid		Status and Purpose
				Supplier	Amount (Million Current US \$)	
Syria (Continued)	Euphrates River	Hydroelectric	Survey	USSR	4 <u>d/</u>	Preliminary survey completed in 1958. By January 1962, Soviet engineers completed plans for dam and powerplant. Plant capacity to be 345 mw. Contract for construction of the project not awarded as yet. The cost of the project reportedly would be \$195 million, so additional credit would be required.
	Homs	Thermal electric	45	Czechoslovakia	3.4 <u>b/</u>	Construction began in March 1961. The first unit is scheduled to go into operation in March 1963. To supply power to a chemical combine to be built with Soviet aid.
	46 generators	Diesel	2 <u>a/</u>	Czechoslovakia	0.4	Contract signed in 1961 for delivery of diesel generators.
	Total		<u>57.5</u>		<u>16.5</u>	
Tunisia	Oued Kasseb River	Hydroelectric	2	USSR	2	An agreement has been signed providing for aid in construction of five dams and the small hydroelectric powerplant. Soviet technicians were preparing plans in 1962.
	Total		<u>2</u>		<u>2</u>	
Turkey	Ikizdere	Hydroelectric	15	Hungary	1	Completed in 1959.
	Total		<u>15</u>		<u>1</u>	

S-E-C-R-E-T

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S-E-C-R-E-T

Recipient Country	Name or Location of Powerplant	Type	Capacity (Megawatts)	Soviet Bloc Aid		Status and Purpose
				Supplier	Amount (Million Current US \$)	
UAR	Aswan High Dam	Hydroelectric	2,100	USSR	250	Initial work underway. Construction of dam and powerplant to begin by end of 1962. Initial production of powerplant scheduled for 1967, to be completed by 1970. Dam and powerplant will provide for irrigation of 1 million acres of land, will control the floods in the Nile Valley, and will almost triple the supply of electric power, enabling a great expansion of industry. To have twelve 175-mw hydroelectric generators. Additional Soviet aid of \$75 million is for irrigation making total Soviet credits for this project of \$325 million.
	Suez	Thermal electric	75	USSR	11	Three 25-mw units were to be shipped to Egypt in 1961 and 1962, but shipments are behind schedule. To supply power to the oil refinery and the city of Suez.
	El Mahalla el Kubra	Thermal electric	24	Czechoslovakia	3 a/	Two 12-mw units were shipped in 1958-59. Completed in 1960. Supplies power to the largest Egyptian textile mill.
	Sugar Mill, Luxor	Thermal electric	9	Czechoslovakia	1 a/	Three 3-mw units were to be shipped in 1961. To supply power to the sugar mill.
	Talkha	Thermal electric	60	Czechoslovakia	2.8	Plant, originally built by Westinghouse, is being expanded by two 30-mw units, which are to be in operation in 1964.

S-E-C-R-E-T

Recipient Country	Name or Location of Powerplant	Type	Capacity (Megawatts)	Soviet Bloc Aid		Status and Purpose
				Supplier	Amount (Million Current US \$)	
UAR (Continued)	69 generating sets	Diesel	35	Czechoslovakia	14	Contract signed in 1961. To start operation in mid-1962 along the Nile, at the Red Sea coast, and at the Suez Canal.
	Al Tabbin	Thermal electric	45	Hungary	5.7	Project was begun in 1956 and turned over to the Egyptians in 1960. Has three 15-mw units. The Hungarian technicians had difficulty in putting their own poorly made equipment into operation and in training the Egyptians to run the plant.
	Damanhur	Thermal electric	30	East Germany	3.3	Completed in 1960. Has two 15-mw units. Because of inefficient and haphazard planning, delays in the delivery of equipment, and mismanagement, the agreed cost was exceeded by almost \$3 million.
	Lebon	Thermal electric	0	East Germany	2.9	A boiler for the Lebon powerplant was scheduled for delivery by June 1957 but was not delivered until 1958. Credit included a transmission network.
	Total		<u>2,378</u>		<u>293.7</u>	
Yemen	Al Hudaydah Port	Diesel	1.2	USSR	0.5 a/	Completed by the end of 1961. To supply power to the Al Hudaydah Port. Contains three diesel generators.
	Total		<u>1.2</u>		<u>0.5</u>	
	Total, all recipients		<u>6,124.5</u>		<u>774.8</u>	

a. Estimated.

b. Including a few commercial agreements that may not be considered aid in the form of long-term credits.

c. Credits for this project were extended by Poland to Brazil in an agreement signed in December 1962.

d. Under survey only.

S-E-C-R-E-T

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Next 1 Page(s) In Document Denied

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