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CLASSIFICATION S E C R E T

CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

REPORT

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IMPERFECT

THIS IS UNEVALUATED INFORMATION

1. Three types of extra-high-tension installations are being developed and manufactured at the Trafo- und Roentgenwerk (Transformer and X-ray works) Dresden (TRW):[4] 25X1

a. Direct current installations with and without acceleration tube (Beschleunigungsrohr);
b. Shock potential installations;
c. Alternating current installations;

2. As far as could be determined, three extra-high-tension installations designed for the production of continuous voltages up to about 3 million V have been manufactured since 1945. The first of these installations which was completed shortly after 1945 was delivered to the USSR, the second installation was sent to the institute at Miersdorf about 1948, and the third was sent to Buch about 1952. All three were equipped with acceleration tubes. In addition, an undetermined number of minor extra-high-tension installation without acceleration tubes was delivered to the USSR, Poland, Czechoslovakia, Hungary, Rumania and China. The direct current installations meet international specifications. The voltage is multiplied by means of Greinach-type switch units. The rectification is performed by means of hot-bulb valves (Gluehventil). The input current in the acceleration tube is about 40 mA, while the current at the last lens is 8 to 10 mA. The installation mounts electrostatic lenses, the adjustment of which is difficult, because at each adjusting process the valve must be opened and subsequently again be evacuated to a pressure of 10^{-5} Torr.[5]

The acceleration tubes were manufactured at the TRW in cooperation with the Zeiss-Ikon Works.[6] In three major installations, this acceleration tube has been mounted vertically.

Recently, the development group headed by Dr. Winter and designer Brey developed a Van de Graaf-type generator for a peak voltage of 2 million V. This generator is scheduled to be delivered to the institute headed by Ardenne and was scheduled to be completed soon.[7] It is not up to the standard of similar generators manufactured abroad. Generally, it can be stated that the TRW is capable of building efficient direct

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current plants designed for voltages of up to 4 million V. An installation for 7 million V was scheduled to be built in the last years but the project was not realized.

3. The TRW is capable of building shock potential installations designed for 4 million V and 100 kW with an impulse length of 50 micro seconds. So far, mainly installations for 2.5 to 3 million V and 30 to 40 kW have been built. The TRW is equipped with a plant capable of producing 2.4 million V and 31 kW. By connecting condensers to it the output of this installation can be increased up to 100 kW. The impact potential curve can be adjusted according to requirements. The impact potential plants manufactured by the TRW can compete on the international market. Since 1945 an estimated 100 such installations have been manufactured and exported to the USSR and to almost all satellite countries. In 1954, 15 to 20 such installations were manufactured. Recently, impact potential installations equipped with manual release have been developed. Pertinent experiments were completed and one such installation has been built. In order to measure the impact voltage curve, a so-called "Wolke" (cloud) was built. This "Wolke" is a system of condensers to which a cathode ray oscillograph is connected. The newly developed oscillograph can be connected to voltages of up to 80 kV and includes a high-tension rectifier which produces a voltage with waves smaller than 10^{-5}. Such rectifiers are also used in electronic microscopes. The picture tube of this oscillograph was developed at the Werk fuer Fernmeldewesen, Berlin. Only a small number of impact potential installations has been built by the TRW. A major istallation was scheduled to be built for an institute in Leningrad but the order was cancelled because of excessive costs.

4. The TRW is in a position to build faultless alternating voltage cascades designed for voltages up to 2.25 million V. In September 1955, experiments were being made to build plants for 3 million V. The short-circuit current at the output stage amounts to 1 A. The generators can be operated on short circuit for up to 30 seconds. TRW annually delivered 20 to 25 such alternating voltage plants to the USSR, the satellite countries and China. In 1948 or 1949 a 2.25 MV plant was delivered to the USSR. The alternating voltage plants require the additional installation of so-called L- and C-members for the rectification of the sine curve. The USSR demanded a degree of rectification which was far above international standards but the Soviet demands could be met. In September 1955, work was under way on the development of a transformer which was to be capable of transforming 6 kV to 4 million V with 3,000 KVA. 2

Measurements made showed that in the 3 MV cascade a short circuit voltage of 30 percent can be maintained.

Alternating voltage plants designed for 2 to 3 MV and 3 to 5 and 10 MVA have been developed for the USSR. The first experimental transformer is now being tested. This transformer has an upright core and horizontal bushings (Durchfuehrungen). Each stage of this type condenser is fed seperately, a device which is designed to reduce the weight of the equipment. The status of the development work indicates that the performance desired will be reached. The new

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transformer will not utilise the double concentric winding principle because too little experience is available with this type of winding. It was believed, however, that double concentric winding will be widely utilised in future because weight reductions of up to 30 percent may be reached by its utilisation. At present, a transformer designed for 1 MV/1 A weighs from 40 to 50 tons. The TRW is equipped with a large assembly shop which has a floor space of about 40 meters square and a clearing height of 40 m. The equipment of this shop is not yet complete because adequate funds are not available. In the middle of the assembly shop there is a pit 8 m deep which is being used for shock impact plants with voltages over 3 MV.

In September 1955, a betatron was being developed and tested. Its output was about 0.5/1 r per minute. The result of the first test was satisfactory. Development work on the betatron was making slow progress because test engineer Kuehler found very little technical and scientific support. No information was available on the development of a 20 MeV betatron planned for 1955. Dr. Eckhardt of Jena was working on the construction of a 30 MeV betatron on the BBC principle. The 6-leg core is to be built by Dr. Winter. It was believed that a useable betatron of this type will not be available on the market for three or four years. The vacuum components for betatrons are being built at TRW. The TRW is equipped for the blowing of glass units and the Metallbedampfung process (metal coating in the vapor phase). A tabulation with rough indications of values required for betatrons was made on the basis of foreign scientific publications and the plants' own measurements. 3

Since September 1954 work on a MeV measuring set has been under way at TRW. Tests made indicate that the set will soon be completed. The set mounts a double counting tube fitting with an amplifier. The soft rays can be cut off at random and so the hard rays can be measured. The 6-fold spark gap which was to be delivered to a Moscow institute was not yet completed in September 1955. The cooperation between TRW and the Dresden Institute of Technology was not very close and did not lead to any real results.

The only information available on the development and manufacture of X-ray plants for voltage over 100 KV was that these plants did not meet international requirements.

Chief engineer Schwarzer was engaged in the building of ultrasonic equipment for medical purposes and electrical equipment to be used for dental and jaw-bone surgery. He is well qualified but progress of his work is delayed by difficulties in the field of materials and by red tape.

The X-ray plant had enough orders on hand. Its output was scheduled to reach a value of 15 million D'E in 1955.

The transformer plant, however, had difficulties in marketing its products. Therefore, mass consumer goods had to be manufactured in addition to transformers. The production of large transformers has

been stopped altogether and the production of small transformers has essentially decreased. In view of all these difficulties, the debts of the plant to the DHZ and the government have increased to 12 million DME. Individual components valued at 6 million DME which were out of date and could not be sold were stored at TRW.

1. Comment. For personal data of leading personnel of TRW, see Annex 1.

2. Comment. For switching diagram of this transformer, see Annex 2.

3.

4. Comment. The abbreviation for the VEB Transformatoren- und Roentgenwerk Dresden, the former Koch und Sterzel plant, has also been reported as TRARD and TuR.

5. Comment. Probably Torricelli unit = mm of mercury.

6. Comment. VEB Zeiss - Ikon Dresden.

7. Comment. The institute headed by Manfred von Ardenne is the Forschungsinstitut fuer Uebermikroskopie und Physik der Ladungstraeger (Research Institute for Ultramicroscopy and Physics of Charge Carriers), Dresden - Weisser Hirsch.

8. Comment. Deutsche Handelszentrale.

Leading Personnel of TRW.

Status of September 1955.

Beger, Horst	chief designer of the X-ray plant,
Brey, Rudolf	chief of designing work for development projects,
Bahrmann, Karl	chief designer of the transformer plant,
Dunkel, Viktor	chief of the sales department (Offertabteilung),
Dummer, (fnu)	development engineer for impact potential plants, direct voltage plants, measuring devices for impact voltage plants and the manual release of such plants.
Famula, Rudolf	manager,
Fromhold, E.A.	in charge of the development of radiation measuring devices,
Dr. Gaebler, (fnu)	development engineer, works with Dr. Winter.
Graichen, Heinz	chief of the transformer plant,

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Gluehmann, Walter	is a departmental leader under Beger. 25X1 25X1
Herfort, (fnu)	production chief, 25X1 25X1
Kohl, (fnu)	assigned to the sales department, 25X1 25X1
Kessner, Walter	labor director, 25X1
Lange, Rudolf	chief of the designs bureau of the transformer plant, 25X1
Lohse, Hans	engaged in the designing of transformers (Wandler) 25X1
Marczinkowski, Horst	chief of apparatus designing, 25X1 25X1
Mende, (fnu)	previously a foreman at the transformer plant, 25X1
Neubert, Walter	engineer by profession, 25X1 since the spring of 1955 assigned to the party executive headquarters of TRW; 25X1 25X1
Protz, Walter	manager of the X-ray plant. 25X1 25X1 25X1
von Schiessl, (fnu)	technical manager, 25X1

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Annex 2

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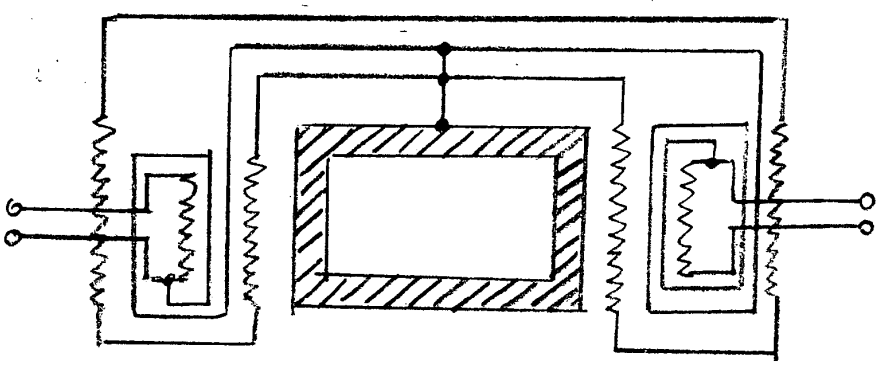

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