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CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

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SECURITY INFORMATION

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COUNTRY USSR (Kalinin Oblast)

SUBJECT Activities at Zavod No. 1, Podberezye

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2. Two groups of specialists were then organized and were given the designation OKB-1 and OKB-2. Directors of these groups were BAADE and ROESSING respectively. The chemical section was incorporated within the second group and was originally under the direction of Hubert EMRICH. Later on (in 1949), direction was transferred to Dr. Heinz DUNKEN. Also assigned to the chemical section as laboratory technicians were Dr. Hans JANKE (physicist), Dr. HAHN, Dr. Willi DANIEL, STEFFES, KNIESTEDT, Gert KEIL and Karl RUDAT were employed as laboratory assistants. The initial period of time, Oct. 1946 to June and July 1947, was partially passed by reading literature, idleness, and by study of theoretical problems. 50X1-HUM

3. Dr. HAHN, using literature data on hand, concerned himself with problems relating to nitrocellulose propellants for small rockets. It should be noted that these were paper projects only. 50X1-HUM 50X1-HUM

4. During the first few months of 1947, construction of a laboratory was begun. Prisoners of war supplied the manual labor. Laboratory benches, made of tile and once destined for a bath house, plus the necessary utility lines were installed, so that by the middle of 1947, a certain

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amount of practical work could be started.

5. Initial laboratory projects primarily covered investigations of T- and C-Stoff [reports to be forthcoming], analyses of metals, fuels, gasolines, and oils that were used in the plant. In addition, investigations of various types of captured war materials that were to be utilized there were also made.

6. OKB-1 was charged with the continued development of the Ju-2-88 aircraft, excluding engines, work upon which had been previously begun in Germany. OKB-2 was to develop the 346 aircraft and engines. A member of this group, SCHELL, was given the task of organizing tests, assembly and operation of equipment for the Walther power plant. In this connection, construction of a power plant test stand was begun in 1948. The Siebel and Junkers groups retained their individual identity as far as grouping of personnel was concerned, even after arrival at Podberezye. The Junkers group was redesignated OKB-1 and the Siebel group OKB-2.

7. No set plan was provided for chemical projects. The Ministry of Chemistry, Moscow, was supposed to issue orders to this group but none were forthcoming. Thus, projects were initiated by the design offices and executed on demand. In addition to the investigation of stability and storage problems of C- and T-Stoff, projects included continuation of the work on the gasless cabin heater, completion of a fire extinguishing system, and development of rupturable membranes for use with this system.

8. The development of the fire extinguishing system was accomplished by a division of OKB-1 under von SCHLIPPE in association with several assistants. It was based upon use of a nitrocellulose explosive charge which could be ignited by the pilot in case of fire. This in turn broke the retaining membrane and allowed nitrogen gas pressure to force carbontetrachloride through pipelines to the area of the fire.

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9. For correct operation of the extinguisher, it was necessary to obtain material for the rupturable membranes which would be capable of withstanding the action of carbontetrachloride, but which could be destroyed easily by a detonator. After a number of experiments with other substances, such as keratin, it became evident that a paper saturated with glycerin and glue would be suitable for this purpose. The membrane required had to be absolutely tight against CCl_4, since leakage would in itself cause loss of ignition properties of the nitrocellulose. The explosive consisted of a nitrocellulose cylinder, and a black powdered detonator. These experiments extended into the latter part of 1948 or the first part of 1949.

10. At the time, von SCHLIPPE's group (OKB-1, Special Projects Department) was conducting experiments on the Argus tube with the intention of improving its thrust characteristics and with decreasing its fuel consumption. [The Argus tube was the power plant used on the old German V-1 and was an externally mounted jet engine.] By 1950 or 1951, the Soviets had developed a light aircraft upon which two Argus tubes were mounted, one on either side of the fuselage. This aircraft was of metal construction, had a fuselage seven to eight meters in length, and a wing span of approximately

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10 meters. Two skids were used for undercarriage, and aircraft was supposed to be a fighter type. 50X1-HUM This project was strictly a USSR development and German nationals were not allowed to see it. 50X1-HUM

11. Von SCHLIPPE's group also conducted experiments on bullet proof fuel tanks following the ideas developed by Messerschmidt toward the end of the war. This consisted of a metal tank with a multiple tube arrangement inside. Tests on this tank were unsuccessful and the project was dropped.

12. OKB-2 continued the project of the 346, and by 1949 had a glider model ready for testing at Teplyy Stan, located approximately 30 kilometers north of Moscow. In 1950, actual flight testing of a Walther powered aircraft was begun at Lukavice airfield in the vicinity of Kolomna. In the first major flight test, the aircraft was carried aloft under the left wing of a TU-4 and dropped from 9,000 meters. The pilot, ZIESE, glided to 7,000 meters then climbed again to 9,000 or 10,000 meters. At a speed of 900 kilometers per hour, the control surfaces blanked out and ZIESE found that he could not alter the plane's course. He reported that it was necessary to bail out. Exit from the 346 was made by detonation of four or six explosive bolts which attached 50X1-HUM the pilot's section to the aircraft. Following this, the pilot ejected himself forward by means of an ejection seat. There was no automatic disconnect mechanism so that the pilot was required to disconnect and pull his own rip-cord.

The dimensions of the 346 were: wing span - 9.0 meters; fuselage length -13.40 meters, with power units, two each; and Walther rocket motors which were capable of producing 2,000 kg. thrust each. Duration of flight with full thrust was to be 10 minutes. The fuel carried aboard this aircraft consisted of one large tank of T-Stoff containing 1200 kg. and two small tanks containing a total of 800 kg. C-Stoff. 50X1-HUM

13. During October 1947, eight Soviet laboratory assistants and an engineer (supposedly a specialist in plastics) arrived and were put to work in the laboratory. these assistants 50X1-HUM had only a very narrow specialized training and had had very little previous laboratory experience. It was some time before they were able to perform simple analyses unassisted.

14. The organic laboratory began experiments on T- and C-Stoff in May 1947 which were to run approximately a year and a half, and experiments toward the production of rocket fuels on the basis of an addition compond of phenol and dimethyl- and trimethyl amine. During this time dimethyl amine was produced in the laboratory from stocks of various raw material taken from the Schering-Adlershof chemical company in Berlin. Dr. DUNKEN completed additional theoretical projects during this time. Among these were calculation of temperatures and pressures in a rocket using various fuels, 50X1-HUM for example, T- and C-Stoff with varying percentages of water, petroleum and nitric acid, petroleum and T-Stoff.

Dr. HAHN constructed a catalyst stand for the decomposition of T-Stoff, while Dr. JANKE was busy with the problems of construction for a fuel ignition delay measuring instrument.

15. The gasless cabin heater consisted of an iron tube 40 cm. long, 8-10 cm. in diameter, and was filled with tablets composed of a mixture of magnesium and aluminum. This mixture was bound together

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with waterglass, dried in a furnace and sealed into the tube. The tablets were approximately 70 to 80 mm. in diameter by 20 mm. thick. They had a hole in the middle into which was inserted an iron rod. When the heater was required, a thermite sheet within one of the tablets was ignited by means of an electrical firing device. Then, by addition of a regulated amount of oxygen, the heating effect of the device was controlled. Various types of tablets were manufactured using different percentages of aluminum and magnesium. The project proved unfeasible and unnecessary since the group later learned that it would be necessary to cool the aircraft rather than heat it.

16. Work on an ignition delay measuring instrument was begun in 1947 or 1948 and required 1/2 year for completion. This project was under the direction of Dr. WEHDE, who was a high-frequency specialist from the physical section. The apparatus consisted of a photo-electric cell and a recording mechanism which utilized the breaking of a beam of light by one fuel being added to the other, followed by a second interruption when ignition occurred. The order to produce such a mechanism came from within OKB-2 and was not of Soviet origin.

17. Since this device was usable only with components which mixed well, it was not adaptable to experiment with Salbei and Kraftstoff A. For the testing of this fuel, an instrument similar to a real power plant was built. The instrument required in this instance utilized a jet of nitric acid into which was sprayed Kraftstoff A. The time measured between the opening of the valve in the Kraftstoff A line, and the beginning of the ignition was taken as the ignition delay.

18. These instruments, and various other instruments, were built from captured German supplies by TYBUS, the mechanic assigned to the chemical section. He also constructed some instruments for delivery to Moscow.

19. Experiments in fuel production based upon aniline and phenol were failures due to the lack of low temperature stability (material at -10 to -20° C). The oxidizer was to have been concentrated nitric acid. Later on, it was decided to experimentally attempt the formation of a hypergolic fuel based on kerosene and Salbei [redacted] An official order from the Soviet Ministry of Air to conduct these experiments was never received. 50X1-HUM 50X1-HUM

20. About the time the work was undertaken on Kraftstoff A, EMRICH was relieved from his post as director of the chemical section and assigned other tasks within the framework of OKB-2. The demand for his release originated with the German specialists, although the Soviets appeared to be in complete accord. He was considered by the specialists as being an extraordinary hazard to their safety because of his incompetence and general lack of knowledge. Thereafter, the production of Kraftstoff A became the principal project, and the organic laboratory worked throughout almost all of 1949, 1950 and into 1951 on it.

21. Some of the other projects within the organic laboratory consisted of experimental production methods on a laboratory scale to determine the best manner in which to concentrate nitric acid from 96 per cent to 99.9 plus per cent. Light metal analyses and Dr. DANIEL's test on corrosion studies with concentrated nitric acid on light metals were also conducted. [redacted] 50X1-HUM

Dr. JANKE undertook the task of repairing a Q-24 spectrograph which had been removed by the Soviets from Zeiss and performed

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[redacted]

quantitative analyses with it. A device for measuring the thixotropic characteristics of Kraftstoff A was constructed by the mechanical machine shop, using the principle of a rotational (paddle) viscosimeter.

22. Testing of a 346 aircraft was started during 1950 on the airfield at Lukavice. KNIESTEDT was thereupon relieved from his duties in the laboratory and assigned to the airfield for the purpose of accomplishing the necessary analyses of T- and C-Stoff there. His laboratory consisted of a temporary building constructed half beneath ground level and protected against the weather by only a board roof. Work on the aircraft was done under a canvas cover in an altogether primitive fashion. A storage tank for fuels was provided at the airfield and T-Stoff was continuously checked according to a published regulation. During 1951, the chemical group was ordered to produce a quantity of boranes for investigation as to their suitability as rocket fuels. The planned work program called for the production of B_2H_6 and B_4H_9 from magnesium boride and from borbromide.

23. These projects started during 1951 and a final order for the work was supposed to have been transmitted to the section, but during May 1951, for reasons unknown to the group, the work was stopped. Later on it was ascertained that the stoppage had been in relation to the repatriation of some of the scientists. From that time on, practically no additional development work was undertaken. Only current work and analyses and simple projects still related to the test flights of the 346 were done. There were still some thoughts of utilization of the gasless heater, so more accurate experiments were undertaken to eliminate difficulties which might arise with its firing mechanism. It was still later that experiments during test flights proved the cabin heater was not needed.

24. Some of the small projects which were accomplished during the waiting period prior to repatriation were:

a. An air hose of PVC was painted with polyisobutylene and was used to supply heated air to the propulsion components of a 346 aircraft. This was connected to the mother aircraft (TU-4) and was used from time of take-off to launching. This was necessary in order to prevent freezing of the T-Stoff in fuel lines and tanks. In addition, the power plant of a 346 was provided with a cover of the same material also to prevent external freezing and crystallization of the T-Stoff.

b. Experiments were undertaken to determine the counter measures necessary in the event of malfunctioning of the quick opening valve in the T-Stoff line due to crystallization. A mixture of kerosene and paraffin oils were used as a lubricant on this valve.

c. Impregnation materials to protect the skids of a 346 from T-Stoff spillage were also investigated. During flight, T-Stoff often dripped on the skids (leaks from the engine) which, through friction during landing of the aircraft, caused combustion of the skids and subsequent loss of the aircraft. The skids were painted with a lacquer made from PVC and additionally covered with a paraffin solution.

25. The R section (rocket powered plant under SCHELL) developed a test stand during the last few years for testing of the rocket system

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component parts and a small test stand for testing Kraftstoff A with Salbei (HNO_3). The latter was also equipped with selector valves which permitted alternate use of Salbei with phenol, petroleum, or other fuels. After ignition and combustion had once been begun by use of Kraftstoff A, switching from one fuel to another was easily accomplished.

26. Instruments necessary to obtain automatic registry of test results in the 346 aircraft required resistances with the contact surface whose electrical value was not subject to change. For this purpose, the resistances were cleared of their dielectric cover at the contact point and plated by immerging in a bath of gold and chrome salts. This was necessary in order to assure usability of the contacts throughout their entire period of life expectancy, which was approximately three to six months. Dr. DUNKEN performed the plating operation using a common plating process - with pulsating direct current, increasing the voltage from four to six volts during the plating time.

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Upon arrival at Podberezye, EMRICH, who apparently had been a laboratory assistant was placed in charge of the chemical group.

He had moved to Halle with Soviet officers and begun to set up the chemical department for rocket fuels in the special office there. EMRICH was later discharged from his post as director of the department in the USSR and Dr. DUNKEN took over as director. The names of the men who were originally in this department were:

Dr. Heinz DUNKEN, lecturer of physical chemistry at the University of Halle.
Dr. JANKE, who formerly worked at the Osram plant.

Dipl. Chem. STEFFES was invited to this special office after the war by an acquaintance.

The following people worked in the laboratory 50X1-HUM : Heinz KNIESTEDT, Gerhard KEIL, and Karl RUDAT.

Approximately eight weeks later, Dr. Willi DANIEL and Dr. Walter HAHN were added to the chemical group. These two chemists came from the powder industry, nitro-cellulose, and had been set up by an office in Warnemuende and were in contact with this office in Warnemuende, but later when the specialists were all evacuated they were first taken somewhere else and came to Podberezye after a while. Dr. DANIEL worked in connection with the Salbei (code for an oxidizing agent containing 98 per cent nitric acid) corrosion experiments using light metals. Dr. HAHN made computations concerning powder questions and later dealt with some analytical problems.

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The plant was divided into OKB-1 and OKB-2 (OKB-1 -Junkers, OKB-2 -Siebel). OKB-2, organizationally under the ROESSING group. 50X1-HUM

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29. [redacted]

The plant was under Soviet management. There were various directors, but they were changed every year. Only the main engineer remained there.

30. [redacted]

WOFNIZENSKIY was the chief Soviet engineer. There was another Soviet engineer there also. He had once been assigned to the office in Halle. The entire organization was under the Ministry for Aviation and a Deputy Minister, LUKIN. This plant was called "Plant No. 1." The engine group was first under the direction of SCHELL, and later UFER. SCHELL was taken to Karaganda for two years forced labor because of an incident of misconduct in a cafe. UFER was later the superintendent of the component parts department for the Walther engine. SCHELL returned from the camp and is still in the USSR; UFER is also still there.

31. [redacted]

32. [redacted] a listing of the OKB-2 specialists /see pages 8 and 9 /.

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[redacted]

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OKB-2 Specialists at Zavod No. 1, Podberezye

	Title	Specialty
Director of OKB-2		
ROESSING	Ing.	
Director of Design Office		
HEINSON	Ing.	
Designers:		
BALLUFF	Ing.	Fuselage
NOETZOLD	Ing.	Wings
HAUBER	Ing.	Procurement & Norms
KOEHN	Ing.	Procurement & Norms
WENZEL	Ing.	Tank Farm
ERGENZINGER	Ing.	
PELZER	Dipl. Ing.	Blasting Bolt
SCHROEV		
GRIESHABER		Model Maker
Aircraft Plant		
RAUSCHEN	Ing.	
MOTSCH	Pilot	
TREUTER	Pilot	
ZIESE	Dipl. Ing.	
Vibration Questions		
Dr. TIEDEMANN	Physicist	
Dr. SANDER	Instructor in Mathematics	Balloons
DIETZE	Dipl. Ing.	
Aerodynamicists		
Dr. SCHMITZ	Mathematician	
Dr. MOTZFELDT	Mathematician	
FUCHS	Dipl. Ing.	
EULITZ	Dipl. Ing.	
Planning Office		
Guenther SIEGFRIED	Dipl. Ing.	
BENZ	Ing.	
SCHERER	Dipl. Ing.	
Physics Laboratory		
Dr. WEHDE	Physicist	
LIMBACH	Ing.	
Statistician		
NEUMANN	Ing.	

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OKB-2 Specialists at Zavod No. 1, Podberezye (cont.)

	Title	Specialty
Plant Direction		
RUFERT	Dipl. Ing.	
Project Preparation		
STOLLBERG		
GERASCH		
FOELLBACH		
R (Rocket) Section		
SCHELL	Ing.	
UFER	Ing.	
MICHAELIS	Ing.	
WERNER	Ing.	
GOLTZ		

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