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INFORMATION REPORT

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SECURITY INFORMATION

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SUBJECT	Development of the DFS-301 and DFS-346 Aircraft Types at Zavod No. 1 Podberezye	DATE DISTR.	18 September 1953
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1. Plant No. 1 (Zavod 1) in Podberezye had a workforce of about 1000 persons, including 250 to 300 who worked at OKB I, about 220 at OKB II, and 450 to 500 Soviets. There were about 1,800 German engineers and dependents in Podberezye.[1] Except for individual departments which occasionally worked in two shifts, work was done in one eight-hour shift.

2. The original DFS-346 airframe, constructed at Halle, was heavily damaged during the transport and was, therefore, used only for ground tests with high-frequency instruments.

3. A remodeled Kranich-type (sic) glider served Wolfgang Ziese as a trainer for flying in prone position. For safety reasons, a second pilot was sitting behind Ziese.

DFS-301

4. The second test model constructed for the development of the DFS-346 was the DFS-301 without power unit. Measuring equipment, including three string oscillographs, two batteries, one master compass for inductance indication, two modified turn and bank indicators which served as angular velocity meters, and two altitude recorders, was installed in the rear of the plane. A quadruple indicator for angle of incidence and for the angle of sideslip besides a voice radio connection to the Tu-2 towing aircraft and to the ground station was installed in the pilot's cabin. The entire measuring equipment had been developed and constructed at Dr. Wede's (Wehde) (fnu) office. The figures obtained by the oscillographs were evaluated by Erich Steek.

5. The construction of the DFS-301 was started in Podberezye in late March 1947 and the plane was completed by early July 1948. The plane was immediately transferred to Moscow/Salarevo (Teplyy Stan) where it was rigged and where the wings were mounted, etc. The aircraft made its first satisfactory test flight

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about 15 August 1948. Then the plane was accepted by the Soviet control commission (OTK - Otdel Tekhnicheskogo Kontrola)[2] who, for three or four days, until about 20 August 1948, checked the DFS-301, and installed and sealed the ejector charge (cartridge) which was to effect the launching of the plane by disconnecting the pipes to release compressed air to the catapult cylinders. The cartridge was removed in the evening of every flying day and reinstalled in the morning.

6. After the first testing program, which included about ten flights and lasted from 20 August 1948 to April 1949, was finished, the aircraft was subjected to several modifications, i.e. boundary layer (fences were mounted) on the wings and the elevator assembly. During these tests the rigid outrigger skids under the wing tips were replaced by larger elastic ones which had been copied from the supporting skids of the Lilly (EF-126), or were dismantled from the Lilly and remodeled for use with the DFS-301. The second testing program included about 20 flights and lasted from July to December 1949.

7. The following modifications were made on the DFS-301 between the first and second flight testing programs: Boundary layer fences, constructed at Zavod 1, were fitted to the plane after the first flight of the second test program. Three fences were fitted to each wing, one 70 to 80 cm from the fuselage, one about one meter from the wing tip and the third one in the center between the other two. One boundary layer fence was fitted to the under-side of the elevator assembly on either side of the aircraft. The installation of the boundary layer fences had been suggested by the TsAGI Institute. The extending mechanism of the main landing skid was at first operated by means of a hand lever, ratchet, and spindle, with a bicycle chain used as transmission between ratchet and lever. This mechanism was replaced by a hydraulic system, since too much time was required for the extending procedure. This modification was also prepared at Zavod 1 and the hydraulic system was installed at Teplyy Stan by mechanics of the Zavod 1 assembly department. The modification work lasted from mid-May to early June 1949. Holding devices for the lead blocks, which were to function as counterbalance to the engine, were fitted to the last bulkhead in the tail of the plane, directly under the elevator assembly. On Ziese's request, a loop antenna was installed and the arrangement and holding device of the antenna mast was modified, because the original arrangement was too flexible and proved liable to flutter. A window was in each side of the fuselage behind the pilot, so he was able to look at the wings. On suggestion of the aerodynamic experts at OKB II, each wing was lengthened by about one meter. However, the flight performance of the plane was not improved by this modification and after two test flights the wings were reduced to their previous length. In accordance with the experiences gained with the DFS-301, the wings of the DFS-346 were not lengthened. All modifications were completed by the end of June 1949.

8. The first flight test program, which was to reveal the flying performance of the DFS-301 at ballast flights with different quantities of water in the fuel tank, revealed exceptionally good aerodynamical properties of the plane. Details on the individual test flights could not be given. [redacted]
25X1 a maximum speed of 500 km/h was allegedly reached during these tests.

9. During the second flight test program the DFS-301 was flown with lead ballast and with the measuring equipment in the fuselage container in operation. Flights at an inclined angle of the path were allegedly flown at V_{max} 750 km/h (maximum path speed). The twelfth through fifteenth flight tests were flown with wooden wings, which were constructed in Moscow. However, already during the first flight, these wooden wings vibrated so violently that the connecting bushings were deformed to oval shape. The bushings had to be ground and the bolts had
25X1 to be provided with chromium plating. [redacted] these wings were very poor in quality; particularly the glued joints were very defective. Between the first and second test flights with the wooden wings the aircraft was checked by the control commission and was released for further test flights after the bushings and bolts were overhauled. After the third test flight the wooden wings were finally dismantled and the project was never mentioned again.

10. [redacted] the flying performance of the DFS-301 during the second test program was excellent. The boundary layer fences, the modifications of the 25X1 extension mechanism of the main landing gear skid, the remodeled outrigger skids, as well as the measuring equipment, proved to be a success. Aerobatics were not included in the testing programs. It was difficult to get the DFS-301 spinning. In stall condition, the aircraft vibrated and then leaned over to the nose. [redacted] 25X1 seldom flown an aircraft of such excellent stability. All modifications experienced with the DFS-301 were utilized for the design of the DFS-346. Furthermore, the DFS-346 was equipped with an adjustable elevator assembly, with limit switch which was to be controlled by an electrically operated spindle, because the control pressure of the DFS-301 was apparently too strong. The electric motor used for this control system was an 1,200 Watt flywheel starter engine, which was to drive the spindle via a transmission. The shoes of the pedal operating the vertical rudder had also to be modified, because [redacted] 25X1 when catapulting out one might get stuck with the tip of the foot. Another modification accomplished on the DFS-346 on the basis of the experiences [redacted] with the the DFS-301 was the locking device of the canopy which, with the DFS-301, could only be opened from the outside by means of a bowden cable through a hand flap. The canopy of the DFS-346 could be opened by the pilot from inside.

11. After the second test program was completed, the DFS-301 was covered with tarpaulins and sealed and remained at Teplyy Stan. It was not known what became of the aircraft.

DFS-346

12. [redacted] 25X1 It was believed that, before September 1950, the aircraft was not subjected to any modifications.

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13. Three identical test models of the DFS-346 were simultaneously under construction. Work on the wings and the fuselages was started in about September 1948, while the assembly of test model No. 3 was started by January 1949, and completed by late February 1949. In early March, test model No. 2 was subjected to vibration tests. The plane, suspended from rubber ropes, had a Leonard engine installed in the wings. These tests lasted about two weeks and terminated between 20 and 25 March. Testing had to be done at night, because during the day the electric current was too weak or failed completely. According to the experiences gained in the vibration tests, the bulkhead in the fuselage, about 20 cm behind the leading edge of the wing, had to be reinforced. Further modifications on fuselage and wings were not necessary. The model was then transferred to Teplyy Stan for gliding tests, with lead ballast in the tail and a Tu-4 acting as tow-plane. This test program was continued until July 1950. The model was then returned to Zavod 1 and parked in a hangar. 25X1
Only once were the skids of experimental model No. 3 of the DFS-346 damaged, [redacted] and landed outside of the airfield. Experimental model No. 2 was completed eight to ten days later than No. 3. After the airframe had been assembled the engine was installed. Including the density tests for the pipes and containers, this procedure required two days. Then the wings were dismantled again and the fuselage with engine was shipped to the engine test stand of Zavod 1 for static thrust tests, etc. The tests lasted two weeks and were completed by late March 1950. Then the wings were packed in canvas-covered crates and the fuselage was covered with tarpaulins and sealed by the control commission. The aircraft was ready to be shipped to another airfield because Teplyy Stan airfield became boggy in rainy weather, and the landing on steel matting seemed too dangerous
25X1 [redacted] The flying program with engines was to start in spring 1951.
The testing team was to include Ziese; Erich Steek, for the measuring equipment; Hans Motsch, as flight administrator; Erhardt Sczuka, as chief mechanic; and an undetermined engineer from the Mantey Group. During summer 1950, experimental model No. 1 was assembled in the same way as the other two models, tested at the engine test stand, and stored as a reserve.

14. For test flights, the DFS-346 was towed by a Tu-4 which climbed to an altitude of about 10,000 meters, from where the DFS-346 was catapulted to glide down.

15. The power unit for the DFS-346, assembled at the engine department under the supervision of Kurt Schell and Herbert Ufer, absolved its State test in January 1950. By this time, three complete double-engines had been completed. Each double-engine reached a total output of 3,000 to 3,500 kgp, but never 4,000 kgp. The double-engines were fueled with "T-Stoff" and "C-Stoff" and included nine steps. Each engine could also be operated individually. The pumping turbine rotated at 18,000 to 24,000 rpm. The longest test run lasted 2.5 minutes. The containers for the T and C-Stoff were pure aluminum.

Dr. Wede's Office

16. The office and laboratory headed by Dr. Wede (fnu) manufactured instruments for the test flight program, such as, measuring instruments for angles of incidence, angles of side slip, acceleration meters, extensometers, and tension indicators. Up to about 30 extensometers and tension indicators had to be manufactured for the TsAGI Institute per month. Also other instruments of this kind had to be continuously delivered in small series to TsAGI and other Soviet offices. These instruments had first operated with potentiometers functioning as pickoffs; however, because of the difficulties encountered in the supply of wire, they were converted to operate on an induction basis. The instruments were packed in boxes and picked up by officers who arrived in sedans.

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1. [redacted] Comment: [redacted] OPN No. 1 had a workforce of about 600 German experts and about 3,500 Soviets. Also [redacted] the German group with dependents included about 1,500 persons.

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2. [redacted] Comment: The English translation for OTK is Technical Control Section.