DIRTY SECRETS

CHEMICAL WARFARE EXPERIMENTS IN THE SOVIET UNION

Although the development of the aeroplane led with depressing inevitability to the concept of delivering poisonous gas and chemicals on enemy troops from above, the practice was banned by international treaty in 1925. Germany and the Soviet Union, however, collaborated on top secret airborne chemical warfare research, as LENNART ANDERSSON reveals

THE PROTOCOL for the Prohibition of the Use in War of Asphyxiating, Poisonous or other Gases and of Bacteriological Methods of Warfare — usually called the Geneva Protocol — was signed in the Swiss city by many countries on June 17, 1925, and entered into force on February 8, 1928. Nevertheless, in the 1920s and 1930s several countries experimented with the diffusion of poisonous chemical substances from aircraft, and its use as a weapon. For some, this was part of preparations for defence against a chemical attack. In other countries, including Germany and the Soviet Union, the testing and development of equipment was oriented towards offensive use. While the former was a signatory to the Geneva Protocol, the Soviet Union was not, although it had ratified it in 1928. The Soviet Union's interpretation was that it was a "no-first-use" treaty that did not ban the development and/or stockpiling of chemical weapons for use in retaliation. The presence of chemical weapons in the Red Army was never officially recognised, however, and was considered top secret.

A SECRET AGREEMENT

Although poison gas was on the list of weapons that Germany was not allowed to possess according to the Versailles Treaty, which went into force in 1920, it was one of the first types of offensive aircraft armament secretly developed there in the 1920s. Disguised as a private venture in the field of pest extermination, gas bombs and the development of equipment for gas diffusion

from aircraft were being designed and tested in Germany. Junkers all-metal aircraft were deemed best suited for the purpose because of the greater ease of decontaminating them after use.

On January 23, 1925, the German Defence Ministry signed a secret agreement with Junkers and Hugo Stoltzenberg's Hamburg-based *Chemische Fabrik Stoltzenberg*, then establishing a factory for the synthetic production of mustard gas, Bersol, at Ivashchenkovo in the south-west of the Soviet Union. The factory proved to be a failure, however, and was later closed.

Flight tests with Junkers-F 13 D-507 were made secretly at Rossitten in Germany (now Rybachy in Russia's Kaliningrad exclave) during May–November 1925. Equipment developed and tested included 200lit (44 Imp gal) and 300lit (66gal) tipping containers; a 250lit (55gal) low-pressure tank; 0·9lit (0·2gal) to 5lit (1·1gal) gas bombs or glass ampoules, and 2lit (0·4gal) to 60lit (13gal) bombs made of metal. From February 1926 the *Gesellschaft für landwirstschaftliche Artikel mbH* (Gela) company was used as a cover for these activities, and it was decided to conduct all further practical experiments in the Soviet Union in order not to compromise security.

A suitable location for the experiments was found at Podosinki, 15 miles (25km) south-east of Moscow, where Ukhtomskaya airfield, a chemical plant and a testing ground already existed. That the facility was situated close to some inhabited villages was not regarded as a problem, as the Soviet authorities had promised to take responsibility for damages caused during the experiments.

Accordingly, a 12-strong German team was despatched, headed by engineer and pilot Hans Hackmack (cover name "Amberg"), and included pilot Friedrich Mühlhan and poison-gas and bomb specialist Ernst Marquard, also a pilot. By August 1926 Junkers-A 20 registration D-719 and two F 13s (D-251 and D-831) had been transferred from Germany with all markings carefully deleted to make identification impossible if observed by outsiders. Flying started late in September and the main tests were completed during November–December. A new type of spraying container, the S 125, was tested and declared suitable and ready for mass production.

A TEMPORARY HALT

In May 1927 the German Foreign Ministry demanded that all tests of this type be suspended owing to political considerations, and the three aircraft were sent back to Germany. This was only a temporary measure, however, and in March 1928 a new test site was found at Prichernavskaya (Shikhany), near Volsk, on the right bank of the Volga, where a specialised joint German-Soviet poison-gas experimental centre was established. It was assigned the cover name "Tomka" by the Germans. The firm Müggenburg GmbH had by this point taken over from Chemische Fabrik Stoltzenberg and became the main supplier of poison-gas chemicals. On March 31, 1928, Firma Schulz & Co, Motoren- und Maschinen GmbH, Berlin — another cover organisation created for the poison-gas experiments — was liquidated; Gela suffered the same fate on June 30 that year. The reason was probably that these names had been compromised. However, a secret test laboratory was built up at Tomka under the guise of an automobile factory belonging to Siemens.

In mid-July 1928 F 13 D-251 and Heinkel HD 40 II D-1180 were flown to Tomka, A 20 D-719 later joining them. The HD 40 had been ordered in March 1927 by the Schulz company especially for poison-gas and bombing tests. The Tomka site continued to operate until August 1933, but little is known about the activities there during 1930–33. A 200lit time-fuzed bomb which exploded at 200m–300m (650ft–980ft) when dropped from

OPPOSITE PAGE, TOP ***Although of poor quality, this rare photograph shows Junkers-F 13 D-507 undergoing secret airborne chemical warfare tests at Rossitten in German East Prussia in 1925.*** **BELOW** ***Another extremely rare photograph, this time showing Junkers-A 35 D-719 (right), with all markings removed, and an F 13 at Podosinki circa 1926–27.***

ALL ILLUSTRATIONS VIA AUTHOR

Junkers-F 13 D-251 (minus hyphen in this photograph) was used by the Germans for poison-gas tests in the Soviet Union from 1926. Like many aircraft secretly owned by the German military, D-251 was registered to the Deutsche Versuchsanstalt für Luftfahrt *(DVL — German Aviation Research Institute).*

RIGHT *After its withdrawal from airborne poison-gas testing with D-251 at Podosinki during 1926–27, Junkers-F 13 D-831 was used by the DVL for trials with experimental tail surfaces, as seen here, to explore methods of reducing control forces. It was later registered to the* Reichsverband der Deutschen Luftfahrtindustrie *(RDL — National Association of the German Aviation Industry).*

BELOW *Suitably remote, Rossitten, now Rybachy on the Russian side of the Curonian Spit between the Curonian Lagoon and the Baltic Sea, close to the border with modern-day Lithuania, was used for poison-gas tests in 1925. By the mid-1920s the dunes at Rossitten had become very popular with Germany's burgeoning glider community.*

ABOVE ***The third Heinkel HD 40 single-engined transport/light bomber, HD 40 II D-1180, was acquired in 1927 specifically for poison-gas and chemical warfare trials. Registered to the DVL, it was ordered through the offices of Firma Schulz & Co of Berlin, one of the various cover organisations created for chemical warfare experiments.***

4,000m (13,000ft) was developed, along with a 65kg (143lb) mustard-gas bomb and the S 200 and S 300 spray containers, but otherwise work seems to have been concentrated on the chemical and physical aspects of gas warfare.

ENTER OSOAVIAKHIM

Meanwhile, the development of both biological and chemical weapons for the Red Army had started. The Military Chemical Administration, led by chemist Yakov Fishman, had been formed in 1925 as the main authority responsible for biological and chemical warfare preparedness. In January 1927 the *Obshchestvo sodeistviya oborone, aviatsii i khimicheskomy stroitel'stvu* (Osoaviakhim — Union of Societies of Assistance to Defence & Aviation-Chemical Construction) was formed as a support agency for aviation and chemical defence projects, absorbing the previous Aviakhim organisation. It was a large group that had sections in most of the larger cities in the Soviet Union. Little had been done in the form of practical development, however, and in 1928 Fishman recommended to Soviet military leaders that an offensive biological- and chemical-warfare programme be organised. Scientists started to evaluate a wide range of bacteria for this purpose and, reportedly, prison camp inmates were used as test subjects.

So-called "pouring aerial devices" (*vylivnye aviatsionnye pribory* — VAP) were developed for the spraying of gas from aircraft of the *Voenno-vozdushnye sily* (VVS — Soviet Air Force) and in March 1928 unsuccessful experiments were undertaken at Podosinki with the Soviet-designed VAP-2 spraying container fitted to an R-1 (a Soviet-built de Havilland D.H.9A copy). The improved VAP-3 was tested on R-1s of the *56th aviaeskadrilya* at Gomel in September 1929, but its opening mechanism was found to be too unreliable. The next version of this device, the VAP-4 with a capacity of 82lit (18gal), was then developed and accepted for series production in December 1930. The following year the first 500 examples were built by the Vulkan factory, later designated *Zavod* (Factory) No 145. The R-1 could carry two VAP-4s and the R-1's successor, the Polikarpov R-5, could carry four.

Other aircraft types were also modified to carry the VAP-4, and it is known that it was tested on an MBR-4 (Soviet-built Savoia-Marchetti S.62bis flying-boat) and a twin-engined Tupolev R-6, and even on a Kamov A-7 autogyro. Chemical warfare was soon considered a normal component of airpower in the Soviet Union, and in addition to developing various types of VAP and *dymovye aviatsionnye pribori* (DAP — smoke aerial devices) for all standard types of aircraft, attempts were made to design a specialised chemical warfare aircraft. This was the Putilov Kh-1 (Stal-5), fitted with two Mikulin M-34 engines. It was designed to be able to carry 200kg (440lb) of chemicals, but

"IN JULY 1937 A LINE OF AIRCRAFT AT A FLIGHT SCHOOL WAS SPRAYED WITH NON-LETHAL TRAINING CHEMICAL AGENT . . . 30 CADETS, INSTRUCTORS AND TECHNICIANS HAD TO BE SENT TO HOSPITAL WITH BURNS . . ."

ABOVE LEFT ***The ABK-1 "ampoule-bomb cartridge" was one example of the many types of chemical warfare devices developed in the Soviet Union in the inter-war period. Here rows of ABK-1s await delivery at* Zavod *(Factory) No 145 in Moscow, where they were produced in substantial numbers.***

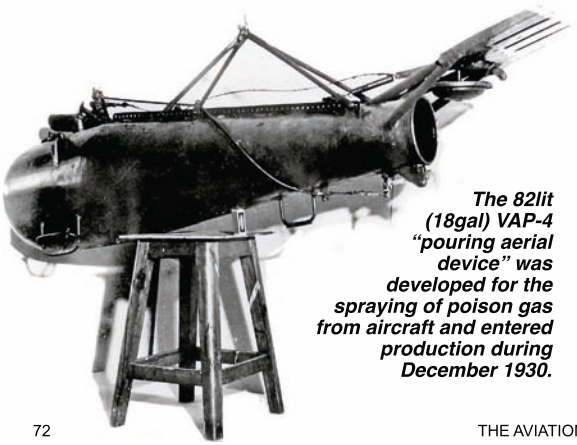
LEFT ***A pair of VAP-4m containers fitted to the lower port wing of a Polikarpov R-5SSS, often referred to simply as SSS* (skorostnoi skoropodemnoi skorostrelnyi *— high-speed, fast-climbing aircraft), which was a specialised ground-attack variant of the R-5. The VAP-4m was accepted for service from 1936.***

in peacetime was to be operated by Aeroflot as a passenger transport. It was developed in project form at Tushino-based Zavod No 81 during 1933–35, but was eventually cancelled. Even when the Sukhoi ANT-25 (RD) long-distance record aircraft was being designed, it was suggested that it should be adapted to carry four to five tons of liquid poison gas in its tanks.

In October 1935 the modified VAP-4m was tested by the NII-VVS (Scientific Test Institute of the VVS), responsible for all state acceptance tests of military aircraft and aviation equipment. Further testing was undertaken at the Shikhany centre, which the Soviets designated the *Tsentralnyi voenno-khimicheskii poligon* (Central Military Chemical Range), which had targets in the form of houses, and live animals were used to study the effects of the gas. When the Germans had evacuated the facility in August 1933, all buildings, including a chemical laboratory, workshops with equipment, machines and tools, filling and power stations, cars and trucks were transferred free of charge to the Soviet Union.

Tests that involved aircraft were normally performed by the 36th Detached Squadron, earmarked for the chemical role. This unit was formed at Prichernavskaya with the R-1, soon replaced by the Polikarpov R-5, and the unit also operated at least one twin-engined Tupolev TB-1 bomber, perhaps temporarily. The VAP-4m was accepted for series production, and from 1936 it was part of the armament for the Polikarpov R-5 and R-Zet, Beriev MBR-2 flying-boat, Ilyushin DB-3 (Il-4) twin-engined monoplane bomber and other types. The larger VAP-5 was tested in 1933, but its development was cancelled. The VAP-6, smaller and intended for fighter aircraft, was produced by Zavod No 145 for the Polikarpov I-15, I-15bis, I-153 and I-16 fighters.

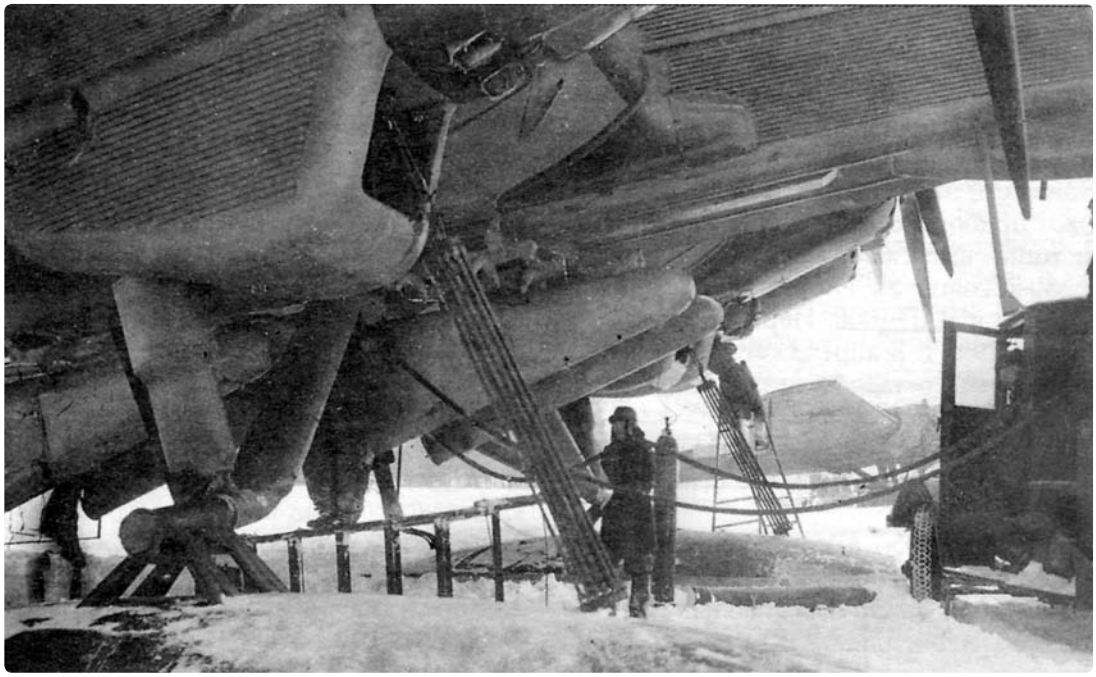
For the Tupolev TB-3 bomber the much larger VAP-K-6 was developed, followed by the VAP-500 and VAP-1000. The latter pair had a capacity of 315lit (69gal) and 705lit (155gal) respectively, and were produced in quantity for the Ilyushin DB-3 and Tupolev SB and TB-3 bombers.



The 82lit (18gal) VAP-4 "pouring aerial device" was developed for the spraying of poison gas from aircraft and entered production during December 1930.

INTO THE INVENTORY

During 1939–40 the 138lit (30gal) VAP-200 was produced for the Kochyerigin BSh-1 (Soviet-built Vultee V-11GB), Sukhoi BB-2 (Su-2) and Ilyushin BSh-2 (Il-2) attack aircraft. The UKhaP-250 and UKhaP-500 dispensers used exploding powder to discharge chemicals, and KhAB-25 and KhAB-200 gas bombs were also produced. Cassettes with small glass or metal ampoules filled with liquid gas that broke on impact with the ground were tested with varying results, and it was only in the



ABOVE ***In 1936 a Tupolev TB-3 M-34RN was equipped as a flying laboratory (TB-3LL) for Soviet chemical warfare research, and cleared the use of the VAP-500, as seen here fitted to the belly of a TB-3. Perhaps surprisingly, battlefield chemical warfare was never used by the Soviets (or Germans), even at the brutal height of the Second World War.***

years preceding the German attack in June 1941 that series production of such equipment started.

By 1933 the R-5Sh attack variant equipped one squadron each of the 251st, 252nd and 255th Brigades, and from 1934 each three-squadron aviaeskadrilya belonging to these brigades had one squadron equipped with the VAP-4. Prospective plans included mass attacks by R-5s, and it was intended to use gas against infantry, cavalry, artillery and horse-drawn carts, which were considered particularly vulnerable. Theoretically, each aircraft could carry four VAP-4 containers, and one air brigade of 100 aircraft flying at 50m (160ft) could discharge a total of 4,500kg (9,900lb) of mustard gas in one mission.

Although the material prerequisites existed, there were, however, problems when it came to preparations in earnest for chemical war, as it was difficult to arrange the storage of the chemicals and the adequate protection of personnel. Open-cockpit types like the R-1 and R-5 were not really suited to the role and most personnel were not trained to handle dangerous chemicals.

There were numerous accidents. On July 29, 1937, owing to a navigational error, a line of aircraft at a flight school was sprayed with non-lethal training chemical agent; about 30 cadets, instructors and technicians were sent to hospital with burns and the aircraft required repair. The pilots responsible were punished for "sabotage". In reality, attacking enemy troops with gas, flying long distances at 50m (160ft) would have involved a great risk of being hit by groundfire. Unsurprisingly, exercises with dangerous chemicals were not popular among VVS personnel.

In the early 1930s the Polikarpov R-5 replaced the R-1, essentially a Soviet-built de Havilland D.H.4. The R-5 could carry four VAP-4 gas containers, as seen on the aircraft nearest to the camera in this photograph.

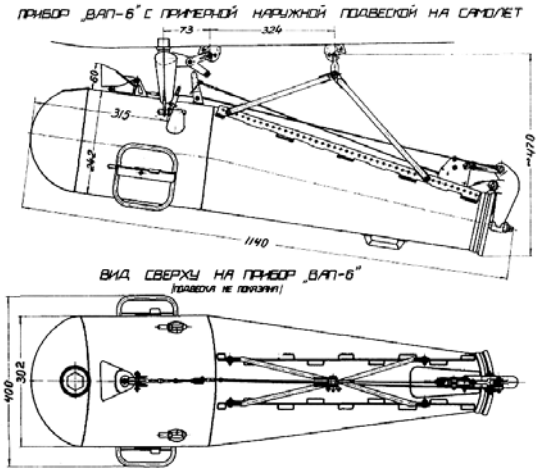
A flight of R-5s is refuelled for another mission. An air brigade of 100 R-5s, each fitted with four VAP-4m containers, flying at an altitude of 50m (160ft) could discharge a cumulative total of some 4,500kg (9,900lb) of mustard gas in a single mission — at least in theory.

In August 1939 a series of tests was conducted with an Ilyushin DB-3B, to evaluate both the efficiency of the VAP-500 spraying device and the safety of chemical warfare operation for the crew. The assortment of bombs that the type could carry included, in addition to ampoule cassettes, AOKh-10, KhAB-200, KhAB-500 and KhAB-1000 chemical bombs. Personnel were taught how to handle the bombs and the VAP-500 at special training grounds, where real chemical-warfare agents (a solution of mustard-lewisite in kerosene) were used. Before a sortie, all openings in the lower surface of the bomber's fuselage had to be sealed and the gas was to be released in straight and level flight only. After each flight the entire rear of the aircraft had to be decontaminated.

THE POLITICAL BRAKE

Did the VVS ever use its stocks of poison gas in war? The answer seems to be no, but several times during the Red Army's 1930s local conflicts its commanders were reportedly ready to employ chemical weapons, but were held back for political reasons. There were such plans for the Soviet invasion of eastern Poland in mid-September 1939 and during the Winter War with Finland during 1939–40, but those conflicts ended before the necessary preparations could be completed.

By the beginning of the war in Europe, the VVS possessed a large number of aircraft capable of carrying devices for gas spraying. Special equipment for refuelling and degassing had been developed and there was a certain amount of trained personnel. Thankfully, no country employed poisonous gas during the war, including the Soviet Union, not even when



ABOVE *The VAP-6 container was produced for fighter aircraft, and was fitted and tested on the Polikarpov I-15, I-15bis, I-153 biplanes and I-16 monoplane.*

the German war machine destroyed cities, killed thousands of civilians and forced the Red Army to retreat almost all the way to Moscow in 1941.

It may have been the risk of similar retaliation, the inherent danger of such methods for one's own personnel, purely practical problems or something else entirely that prevented such warfare. Could it be that even cruel and ruthless dictators like Hitler and Stalin realised the horror of such ghastly methods, hesitated, and ultimately decided to refrain from using them? It certainly seems unlikely, particularly in light of Hitler's grotesque actions — but we shall almost certainly never know.