

Original article

Acquisition and introduction of Leopard 2A4 and 2A5 tanks for and into service in the Polish Armed Forces

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ABSTRACT

On the basis of literature on the subject and generally available public information, the author presents the process of acquisition and introduction of Leopard tanks for and into service in the Polish Armed Forces in the first two decades of the 21st century. He verifies the usefulness of this undertaking and at the same time shows, among others, problems related to technical capabilities of the Polish arms industry as well as provision of logistic support; above all, he uses this example to draw attention to the lack of continuity of actions and numerous changes in the plans for technical modernisation of the army in terms of armoured vehicles.

KEYWORDS

Leopard 2A4, Leopard 2A5, technical modernisation, logistics, armoured forces



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Introduction

The end of the Cold War and the signing, in late 1990, of the Treaty on Conventional Armed Forces in Europe brought about a significant reduction in armoured arsenals [1]. At the time, the Polish Armed Forces had at their disposal approx. 2800 tanks, including 2100 T-55s, largely upgraded to the T-55AM standard [2], and approx. 700 T-72s [3]. 1994 marked the start of production of the PT-91 Twardy tank, which was a modernisation of the T-72. Between 1994 and 1997, 92 standard production tanks were manufactured; between 1997 and 1998, 27 were rebuilt to the PT-91M standard, while between 1998 and 2002, further 113 were rebuilt, this time to the PT-91MA1 standard. At the same time, during the final decade of the 20th century and the early 21st century, all T-55s were retired, which significantly reduced the armoured potential of the Polish Armed Forces to approx. 850 T-72s and PT-91s, new, but even at the time not state-of-the-art compared to both Western European and Russian designs. The problem was also the not too technically advanced 3BM-15 ammunition, cal. 125 mm, which not only failed to bridge, but actually widened the already existing technological gap.

In 1997, in relation to the arrangements for Poland to join NATO, the “Plan for the modernisation of Armed Forces for 1998-2012” (“Army 2012”) was adopted; its assumptions included reduction in the number of soldiers and integration of the army with NATO structures. As financing was provided only partially, changes were slow. A breakthrough occurred in 1999, when Poland joined NATO, which forced further changes in the areas of national security and modernisation of the Polish Armed Forces. It was then that the German Ministry of Defence first proposed to supply Poland with Leopard 2A4 tanks. Accepting such a solution, but also developing it in a comprehensive and consistent manner, could have provided the Polish army, given the cost-to-result ratio, with the only option to quickly and effectively build the potential of its armoured forces. However, despite the fact that the undertaking was realised, it seems that it was not fully and properly taken advantage of.

1. The Leopard 2 tanks

In the 20th century, Germany made a huge contribution to the design, development and the manner of use of armoured vehicles. The lost World Wars, though each time severely diminishing the capabilities of the German arms industry, ultimately never resulted in its complete destruction. Each time, the German technical thought was reborn, resulting in proposals for new designs, suitable for the conditions of a rapidly changing battlefield and competitive compared to their counterparts in other armies.

The history of the German Leopard tanks dates back to the 1960s. In the middle of the decade, after several years of enormous design efforts and tests, the first Leopard 1 tanks, built in the classic arrangement, left factory floors. The steering compartment was placed at the front, the combat compartment in the middle, and the drive compartment at the rear of the hull, which was made of rolled and welded armour plates. Compared to other main battle tanks (MBTs) of the 1960s, Leopard 1 – which was manufactured between 1965 and 1979 – stood out primarily through its high tactical manoeuvrability. It stemmed from its refined drive assembly, consisting of a 830 hp Daimler-Benz MB 838 CaM 500 Diesel engine and a ZF 4 HP 250 hydro-mechanical transmission system. The tank’s armour was relatively weak, as, according to German doctrine, survivability was meant to be ensured primarily through mobility. The tank was armed with an L7A3 cannon, cal. 105 mm, manufactured under British licence, which was fairly good for the time.

Unlike many German designs of World War II, Leopard 1 was a successful vehicle. Thanks to a long period of testing, it was a refined tank, with low failure rate, highly mobile, but also characterised by high fuel consumption. The experience from the tank design, deployment and operation phases provided a solid foundation for development of a completely new design. This ultimately became the Leopard 2. Work on the tank was entrusted to Krauss-Maffei. On 4 October 1979, the first standard production vehicle was accepted and the Leopard 2 tank was symbolically introduced into service in the Bundeswehr.

Leopard 2A0 was the first Western tank belonging to the so-called third generation. The first series of vehicles was manufactured between 1979 and 1980, with 380 tanks produced. 1982 marked the beginning of production of a slightly modified version, designated A1. By 1983, 750 A1 model tanks were produced, in two batches. Along with production of A1 vehicles, the first production batch received modifications, which were then designated A2. At the end of 1984, the production of Leopard 2A3 began, with 300 tanks manufactured by December 1985. At that point, the most numerous series, i.e. Leopard 2A4, entered production; over time, all earlier models were upgraded to this standard. Between 1985 and 1992, 695 vehicles

were manufactured, in four batches; these tanks were characterised by a much higher level of protection and ensured greater survivability for the crew through changes in the armour and introduction of a fire and explosion prevention system. In addition, Leopard 2A4 was equipped with digital ballistic computers, and the final production batch (75 vehicles) featured a system for aligning the cannon with targeting instruments.

In 1987, a concept for modernising the Leopard 2 appeared in Germany. The conducted research and development resulted in the Leopard 2A5. The first 2A5 vehicle entered into service in the Bundeswehr on 30 November 1995. Over several years, 285 vehicles were upgraded to the A5 standard; of these, 160 were rearmed, becoming the next development version – A6. The newest version of the tank is the A7.

Leopard 2A4/2A5 was built in a traditional design arrangement. The front part of the hull houses the steering compartment, the middle part houses the combat compartment, while the rear houses the drive compartment. Both the hull and the turret are made of welded rolled armour plates. Overtrack shelves are placed on the sides of the hull, housing some of the fuel tanks, a system for protection against weapons of mass destruction, and batteries. The hull of the Leopard 2 is 7.72 m long, or 9.67 m with cannon. The tank is 3.75 m wide and 2.79 m high. Its ground clearance is 490 mm. The vehicle's combat weight is 55 t. The tank's crew comprises four soldiers: a commander, a driver, a gunner and a loader. The main armament of Leopard 2A4/A5 is a smoothbore cannon, cal. 120 mm, with a length of approx. 44 calibres (RH120 44). Leopard 2 had a heavy armour. It was the first mass-produced MBT to have special armour, which until mid-1980s provided effective protection against sub-calibre ammunition used by other armies, especially the armed forces of the Soviet Union [4, p. 22-23]. It is estimated that in the areas with the best protection, the armour of the A4 model could stop high-explosive anti-tank shells capable of piercing 600-700 mm of steel.

Mobility remains an important asset of Leopard 2. The tank has a powerful, twelve-cylinder, liquid-cooled MTU MB 873 Ka-50 engine. The engine has a displacement of 47.6 l. Its output is 1100 kW (1500 hp) at 2600 rotations per minute. This equates to a per-unit power coefficient of 20 kW/t (27.2 hp/t) for Leopard 2A4 and 18.4 kW/t (25 hp/t) for Leopard 2A5.

2. The first Leopard 2 tanks in the Polish Armed Forces

On 18 February 2000, on the basis of a concluded agreement on the creation of integral structures of selected units, the General Stanisław Maczek 10th Armoured Cavalry Brigade was subordinated to the 7th Armoured Division of the Bundeswehr and became a part of the Allied Command Europe Rapid Reaction Corps. However, ensuring full interoperability without standardisation of armoured vehicles, logistics, means of communications and command, and finally procedures, was practically impossible, which meant that a thorough and costly modernisation would be necessary.

On 25 May 2001, the Polish Parliament adopted the "Act on restructuring and technical modernisation as well as financing of the Polish Armed Forces for 2001-2006" [5], obligating, among others, the Ministry of National Defence to prepare the "Programme for restructuring and technical modernisation of the Polish Armed Forces for 2001-2006" [6], which had been worked on since 2000. In addition to reduction in the number of soldiers, assumptions of the Programme included modernisation of T-72 tanks to meet NATO standards through application of a 120 mm cannon (which so far has not been realised) and acquisition of qualitatively new tanks. The Federal Republic of Germany, which upheld its offer to supply Leopard 2A4 tanks for the 10th Armoured Cavalry Brigade, was a natural partner.

Arguments which supported this solution were presented multiple times by the then Minister of National Defence, Jerzy Szmajdziński. In his answer to the enquiry made by MP Stanisław Dulias, he stated, among others, that “[...] the PT-91 tank manufactured by BUMAR-Łabędy is an improved version of the T-72 tank, which was built in Poland under a licence granted by the former Soviet Union. The combat potential of this tank has remained virtually unchanged. It is undoubtedly a very good product in terms of design. However, this does not change the fact that it is at least one generation behind the tank armoured vehicles manufactured in NATO countries. Furthermore, the options for upgrading the T-72s to PT-91s are restricted due to limitations of the yet-to-be-installed thermal imaging cameras that have already been purchased and the state of the barrels in the remaining tanks, which are not fit for use due to their wear. Moreover, these parts cannot be manufactured domestically. The cost of modernisation of a single tank is currently PLN 5.5 million. This means that this undertaking carries significant costs, yet leads to only a slight increase in combat capabilities [...]” [7].

Despite the pressure from representatives of the Polish arms industry who opposed this solution, as early as 2001, Polish experts from Świętoszów began to train in German centres in Munster, Aache, Düsseldorf and in subunits of the 7th Armoured Division in Wolfhagen near Kassel. By the end of that year, a total of 52 tank commanders and instructors, 15 drivers and 49 logisticians were trained [8, p. 10].

On 29 January 2002 in Berlin, the Minister of National Defence of Poland Jerzy Szmajdziński and the Federal Minister of Defence of Germany Rudolf Scharping signed an agreement to supply Poland with 128 Leopard 2A4 tanks from the Bundeswehr’s surplus equipment, several dozen thousand complete rounds of ammunition with a market value of approx. EUR 55 million as well as approx. 200 support and logistics vehicles and to train 492 Polish soldiers. 29 April, in turn, marked the conclusion of agreement no. GER – BMVg-Numer Q/A15A/1A025/1B141 and POL – 160/U/1 between the Minister of National Defence of the Republic of Poland and the Federal Minister of Defence of the Federal Republic of Germany for the supply of arms and military equipment [9, p. 142-143; 10]. In addition, Poland was meant to gain the capability to produce modern 120 mm cartridges in its plants and to carry out repairs, and negotiated establishment of cooperation with the German arms industry in selected areas related to improving interoperability between German and Polish military equipment. However, no clear declarations were made at the time [11, p. 47-48].

The concluded agreements provided the basis for development of a new comprehensive training programme for Polish experts and initiation of the process of qualifying tanks from among 600 vehicles proposed by Germany. Ultimately, Polish commission selected 6 tanks manufactured in 1985, 96 tanks manufactured in 1986 and 26 tanks manufactured in 1987. These tanks had a mileage of less than 2 thousand km, and their wear was estimated to be between 20% and 30%, as most of them had been placed in long-term storage for several years, and only some had been used in units. The cost of acquisition was between 90 and 100 million Polish zlotys, which was meant to cover primarily expenses related to dereservation and transportation of the supplied vehicles [12, p. 62].

In June 2002, training of Polish personnel resumed. Soldiers who underwent training in 2001 continued their education using simulators at the Armoured Corps Training Centre in Munster, and then underwent field training. In July, they were directed to the 64th Tank Battalion in Wolfhagen to familiarise themselves with vehicles which were being prepared for acquisition by the Polish Armed Forces. This was also when preparations began to transport the first 15 vehicles to the 1st Tank Company of the 1st Battalion of the 10th Armoured Cavalry

Brigade in Świętoszów. They arrived by rail on 7 and 8 September, together with 30 Mercedes 1017 trucks, 10 Unimog 435s and 2 Geländewagens [8, p. 10].

On 16 September, with participation of the President of the Republic of Poland and Commander-in-Chief of the Polish Armed Forces, Aleksander Kwaśniewski, the Federal Minister of Defence of the Federal Republic of Germany, Peter Struck, the Minister of National Defence of the Republic of Poland, Jerzy Szmajdziński, the Inspector General of the Bundeswehr, Gen. Wolfgang Schneiderhan, and the Chief of the General Staff of the Polish Armed Forces, Gen. Czesław Piątas, a symbolic transfer of the tanks to the Brigade was held.

Over the next few months, the 10th Armoured Cavalry Brigade received further batches of Leopard 2A4 tanks, together with supporting equipment and ammunition; at the same time, personnel training was underway in Germany. In January, the unit in Świętoszów received a total of over 40 Leopard 2A4 tanks; this number was doubled by July, and supplemented with additional vehicles in autumn. In total, the Brigade received 116 tanks. They became a part of the equipment of both Tank Battalions of the 10th Armoured Cavalry Brigade. On 21 October, at the repair base in Unterlüß near Bremen, Polish experts received the last tank. After the unit in Świętoszów was equipped with Leopard tanks, 12 vehicles were sent to the Expert Training Centres in Poznań and Wędrzyn [13, p. 30]. The supply of ammunition to Poland was finalised in June 2003.

The supply of the first German vehicles for the 1st Tank Battalion in autumn 2002 and the initial training of personnel made it possible to gather the first experiences from the operation of Leopard 2A4 tanks very quickly. Between 9 and 23 November, the crews of 30 Leopard tanks, together with German tank officers from the 64th Armoured Battalion, trained to improve cooperation at the Żagań Land Forces Field Training Centre; these field exercises were codenamed *Arcade Fusion 02*. During the exercises, in addition to firing, the two companies performed, among others, a counter-attack using tanks as a division reserve. On 13 November, while the exercises were still ongoing, the Brigade received a certificate confirming achievement of the level permitting them to operate as part of the Allied Command Europe Rapid Reaction Corps [14, p. 32].

In the spring of 2003, the process of equipping the 1st Tank Battalion was completed. It received a total of 53 Leopard 2A4 tanks, together with supporting equipment. Tank officers underwent complete training, culminating in a two-week field exercise in late April and early May. In addition to practising cooperation with subunits of air cavalry and paratroopers as well as Mi-24W combat helicopters, and cooperation between the battalion and artillery as well as sappers, training involved multiple firing exercises. This field exercise confirmed the expected high manoeuvrability of the vehicles and their combat parameters, including the high effectiveness of laying down fire, both during the day and during the night. Conducted exercises included special firing of a platoon of tanks at rocket launchers set at a distance of 2400 m, directing the fire of a company of tanks in defence during the day and during the night (crews destroyed 49 out of 54 cannon targets) and directing the fire in attack with two companies of tanks (38 out of 42 targets, set at distances between 700 and 2500 m, were destroyed). According to report of the commander of the Brigade, tank officers were able to destroy nearly any target located at a distance of 2.5 km with the first shell, and the fire response time did not exceed 15 s following target detection.

As confirmed at the meeting of the parliamentary Committee for National Defence by commander of the Brigade, Brig. Gen. Stanisław Samol, field exercise proved that the 1st Battalion from Świętoszów was, at the time, the only subunit of Land Forces capable of effective

combat against the enemy at night. He also indicated that, as expected, the tanks proved very economical compared to PT-91s: “[...] A tank battalion equipped with 40 PT-91 tanks needed 60 tonnes of fuel to conduct the same exercise. The exercise was conducted under the same conditions, under which the 53 “Leopard” tanks were used. They consumed 39.5 tonnes of Diesel fuel. It can be concluded that with the new training system, we saved approx. 1/3 of fuel. Over 10 months of equipment operation and training, we have had no failures of engines, gearboxes or intermediate gears. The previously used tanks occasionally had such failures, leading to additional costs” [15]. Savings are clear also when looking at years 2001-2003. In 2001 and 2002, the costs of maintaining PT-1 tanks were approx. PLN 105 million. In 2003, when one battalion was rearmed with Leopard 2A4 tanks in the first six months, and the other by the end of the year, maintenance costs were reduced by 20%. According to estimates of the commander of the Brigade, savings were ultimately meant to reach 50%. Brig. Gen. Samol stressed that just the tactical and fire training of a battalion of PT-91 tanks costs nearly PLN 3 million, while the same training with Leopard tanks costs only PLN 1.4 million [15].

The next stage of training and coordinating of the subunits of the Brigade related to the use of the new equipment was a three-week exercise held in October 2003 at the Biała Góra Underwater Training Centre near Krosno Odrzańskie, where the ability to use Leopard tanks in full submersion when pushing through water obstacles, as well as cooperation with other units, were tested in practice. This was one of the last stages of training for the soldiers of the Brigade, which at the end of the year achieved full combat readiness [13, p. 30].

Together with 128 Leopard 2A4 tanks, acquisition included complete supplementary equipment for command and technical support subunits as well as training equipment: 10 Bergepanzer (BPz) 2A2 technical support vehicles, 6 Brückenlegepanzer-I Biber armoured vehicle-launched bridges, 16 armoured ambulances on the M 113 transport vehicle chassis, 19 M 113/M577 vehicles for establishing command posts, 25 Mercedes-Benz GD290 Wolf off-road vehicles, a Heros automated tactical formation command system, 91 5-tonne Mercedes-Benz 1017 trucks, 29 2-tonne Mercedes-Benz Unimog 1300L off-road trucks, 6 units for transporting heavy equipment, as well as 57 training devices and simulators, including 3 ASPT firing simulators and 48 AGDUS laser firing simulators [16, p. 21]. In addition, Poland received several dozen thousand rounds of ammunition, including a 7-day supply of combat ammunition and a 24-month supply of training ammunition. Germany also undertook to train soldiers at its own cost. Soon after, officers, non-commissioned officers and maintenance technicians were sent to multiple courses and training sessions in Germany; the process of training Polish instructors had also begun. In total, nearly 1000 people underwent training in German centres.

3. More Leopard 2 tanks for the Polish Armed Forces

On 24 June 2003, due to complete lack of preparation of logistic structures to handle modern vehicles, a supplementary agreement was concluded between the Ministries of Defence of the Republic of Poland and Germany to include the Armoured Brigade in the logistic support system of the Bundeswehr. Initially, ordering components was the responsibility of German experts, who were incorporated into the 10th Brigade on a virtually permanent basis. Over time, these competences were transferred to Polish experts. For nearly 8 years, Poland had also been receiving parts at preferential prices; however, after a few years, these parts became scarce, especially those related to the fire control system and cannon stabilisation. In addition, Germany supplied a set of maintenance equipment and tools for servicing the

vehicles in the unit – MES-1/2/3 and partially MES-4. The value of the equipment donated by Germany was approx. PLN 1.5 billion; this figure would be much higher if training was taken into account. Just between 2010 and 2014, funds expended as reimbursement of costs of purchase of technical material resources by the Bundeswehr and provision of services within the German logistic support system totalled PLN 75.26 million. This figure does not include F6 technical inspections and resulting repairs carried out by German companies in cooperation with Polish companies under concluded agreements [17]. The first more major repairs of Leopard 2A4s were carried out only in 2011, and consisted of servicing of 30 tanks by experts from WZM S.A. in Poznań.

In the spring of 2007, after several years of stagnation, the subject of acquisition of more Leopard 2A4 tanks for the Polish Armed Forces was back on the agenda. In March, the Minister of National Defence, Aleksander Szczygło, met with the Ambassador of Germany in Warsaw to discuss the issue and talked about the possible purchase of 123 tanks for use by the 34th Armoured Cavalry Brigade in Żagań. Discussion also concerned issues related to offset, transfer of technologies and potential participation in future modernisation, that is, those issues that were not sufficiently clarified in 2002. However, Germany did not want to donate the equipment to the Polish Brigade without specific provisions guaranteeing that their arms industry would be involved in the maintenance and future modernisation of the supplied vehicles. This raised considerable objections on the part of the Polish arms industry, which stoked the discussion about the pointlessness of purchasing Leopard tanks and the need to modernise the PT-91s. The Ministry of National Defence, which at the time prioritised the Polish Military Contingents sent abroad, forwent further talks at the end of the year, claiming that this was done for economic reasons.

This decision was also largely influenced by the conviction of some military officers that the obligations to equip at least one armoured brigade with vehicles guaranteeing integration with Western NATO armies had been fulfilled, and the number of tanks at Poland's disposal is sufficient. Right at that time, when the fate of the purchase of additional Leopard 2A4 tanks was at stake, the General Staff was working on the "Programme for development of the Polish Armed Forces for 2009-2018". Its assumptions included a gradual reduction in the armoured potential of the Polish Armed Forces and retirement of approx. 200 of the oldest T-72 and T-72A tanks. Moreover, no modernisation was planned not only for the T-72s, but also for the PT-91s; acquisition of the modern armour-piercing ammunition, cal. 125 mm, for these tanks was also stopped. The programme assumed that until 2018, six battalion equivalents of T-72 tanks, four battalion equivalents of PT-91 tanks and two battalion equivalents of Leopard 2 tanks would be kept in line. However, pursuant to the idea from 2007, it did provide for the option to increase the number of Leopard 2 tanks and use them to rearm yet another armoured cavalry brigade [18].

Favourable circumstances to make use of this option appeared in 2011. On 2 August, Tomasz Siemoniak became the Minister of National Defence, and soon after, in September, Gen. Waldemar Skrzypczak, who was in favour of purchasing Leopard tanks, became his advisor for technical modernisation. Nevertheless, no public information concerning such intent appeared in the next few months. It was known at the time, however, that Germany was planning to sell Leopard 2A5s, and also opened the possibility to purchase Leopard 2A6NLs. It was the offer to sell the surplus tanks of the Bundeswehr that caught the interest of many countries, especially Finland and Poland. This stemmed from the lower wear of German vehicles and the options to purchase support vehicles, training equipment and ammunition as well as to take advantage of the experience of the German logistics system.

The first serious signals related to the purchase of Leopard 2A5 tanks began to appear publicly following the meeting between Minister Tomasz Siemoniak and the Inspector General of the Bundeswehr, Gen. Wieker, held on 7 November 2012 [19]. In January of the following year, the Minister confirmed that the Ministry of National Defence would be interested in purchasing Leopard 2 tanks, while on 4 March, the then Deputy Minister, Gen. Waldemar Skrzypczak, informed reporters that Poland was interested in purchasing two battalions of Leopard 2A4 or A5 MBTs [20]. He emphasised that Poland would receive the tanks most likely still in 2013, and that in addition to them, the Army was interested in complete battalion modules that would make it possible to completely rearm a brigade, as was the case with the 10th Armoured Cavalry Brigade.

Representatives of the Polish arms industry were firmly opposed to this purchase. Opinions on the matter were expressed, among others, by Stanisław Janas, Chairman of the Federation of Trade Unions of Special Industry, who stressed that a few years prior, the Government had assured Polish industrialists that, apart from the supply of German Leopard tanks completed at the start of the century, there would be no others, and the modern solutions for the Army would be provided by the domestic industry. He also criticised the very slow introduction of Polish companies to servicing of the German vehicles, as the process was only started a decade after the German Leopard 2A4s became a part of the equipment of the 10th Armoured Cavalry Brigade. In September 2013, in an interview for the Defence24 website, Stanisław Janas said: “[...] And now we hear that Poland intends to purchase another 105 Leopard tanks. This is surprising to us, as Poland does have a concept of a new tank, and while it is true that it will not be leaving production lines for a few more years, we are talking about a domestic design that is meant to be an answer to the declarations made by the Ministry of National Defence that in 2016, the Army will be needing a new tank. And the industry is committed to meet this need. In my opinion, the number of Leopard tanks that we have right now is sufficient, hence the opposition on the part of trade unions” [21].

The purchase of Leopard 2A5 tanks was undoubtedly a surprise for a lot of people, especially at a time when the budget of the Ministry of National Defence saw significant cuts, including with respect to one of the key programmes related to missile defence. Nevertheless, the information concerning the purchase was positively assessed by most experts dealing with the broadly understood defence. In addition to positive experiences from the use by Świętoszów tank officers, the transaction was supported by hard data. Experts indicated that the Polish arms industry has no actual technical capabilities to create a modern vehicle from scratch in a few years, but also pointed out the considerable role it could play in upgrading the A4 and A5 model tanks to a higher standard [22]. They also pointed out the clear operational and servicing differences between the German Leopard tanks and their contemporaries T-72M1s as well as the newer PT-91s, claiming unequivocal superiority of the German vehicles.

A few weeks later, on 22 November 2013, the Minister of National Defence, Tomasz Siemoniak, and the German Federal Minister of Defence, Thomas de Maizière, signed, at the Land Forces Training Centre in Poznań, Agreement No. IU/238/ X-86/ZS/NEG2/DOS/S/2013/371 for the purchase, for approx. EUR 183 million, of another batch of Leopard 2 tanks (119 vehicles) from the reserves of the Bundeswehr: 105 Leopard 2A5s, 14 additional Leopard 2A4s and approx. 833 pieces of support equipment [10].

When the purchase of the vehicles was planned, for a long time there was no information about the unit which would receive them. Two destinations were considered above all: the 1st Warsaw Armoured Brigade in Wesoła near Warsaw and the 34th Armoured Cavalry Brigade

in Żagań. It was ultimately decided that the Leopard 2A5s would be directed to Żagań. That Brigade, together with the 10th Armoured Cavalry Brigade which makes use of the Leopard 2A4s, form the core of the King John III Sobieski 11th Lubusz Armoured Cavalry Division; as a result, the decision not only increased its capabilities in terms of combat and cooperation, but also facilitated logistics and training and significantly reduced operating costs. The decision was also influenced by the closeness of the Żagań – Świętoszów Field Training Complex, which includes the “Leopard” Training Centre that has at its disposal training devices, existing propellant and lubricant warehouses as well as garages in Żagań capable of storing the entirety of equipment, including support vehicles. Thus, despite the objection of the General Staff, which claimed that the 34th Brigade is insufficiently manned, having only 26% of the necessary number of soldiers in 2014, it was decided that the Brigade in Żagań would be rearmed with Leopard 2A5 tanks.

To ensure proper assessment of the purchased equipment, teams of Polish experts were created, which were meant to inspect and qualify the vehicles presented by Germans for acceptance. Acceptance took between a month and a half and six months. The supplied equipment was technically fit and had all necessary components. Acceptance teams noted no instances of vehicles being supplied with damaged drives. No damaged cannon barrels were identified either, and their wear was, on average, between 30% and 50%. For this reason, the tanks were able to enter into service and begin their regular operating cycle directly after being supplied to the Polish Armed Forces, with no additional measures [23].

The first transport of Leopard 2A5s was directed to Poland by rail in the spring of 2014. On 16th May, the 34th Armoured Cavalry Brigade received more than ten tanks. During the ceremonial acceptance, Brig. Gen. Jarosław Mika, commander of the Brigade, stated that “The 11th Lubusz Armoured Cavalry Division is the only tactical formation in the Armed Forces which can be called a “heavy division”. So far, its combat potential was determined primarily by the 10th Armoured Cavalry Brigade, which is equipped, among others, with Leopard 2A4 tanks, and the 17th Greater Poland Mechanised Brigade, which has at its disposal the Rosomak wheeled armoured transport vehicles. Thanks to the newly supplied equipment, the group of the important and modern units of the Polish Armed Forces will now be joined by the 34th Brigade” [24, p. 95].

The next transport arrived at Żagań a few weeks later. On 6 June, PKP Cargo delivered 49 Leopard 2A5 tanks, which were efficiently collected from a sidetrack and delivered to the unit [25]. On 16 October, 14 more Leopard 2A5s arrived in the third transport [26]. By the end of the year, the Polish Armed Forces gained a total of 91 Leopard 2A5/A4 tanks (77 Leopard 2A5s and 14 Leopard 2A4s) as well as 654 pieces of support equipment [10]. Despite turbulence on the German side and protests of some politicians demanding termination of the contract, deliveries continued the following year. The final transport of Leopard 2A5 tanks arrived at the sidetrack of the 34th Armoured Brigade in Żagań on 27 November 2015. Receipt of the tanks was attended by commander of the “Black Division”, Major Gen. Jarosław Mika, commander of the 34th Armoured Cavalry Brigade, Col. Krzysztof Pokropowicz, and the Chief of Brigade Staff, Lt Col. Zbigniew Śliżewski [27]. In total, in 2015, 28 Leopard 2A5 tanks and 179 specialist vehicles were received [10].

After the first Leopard 2A5 tanks were accepted, before they could be introduced into service, they needed to undergo normative inspections, and also had to be registered. Before that, however, intensive training of crews in vehicle operation had begun at the Leopard Training Centre in Świętoszów. The first soldiers to be sent to that training were those who had already

been certified to operate the earlier version of the vehicle. 1 October 2014 marked the beginning of a 36-month training cycle for soldiers of the 1st Brabant Tank Battalion, aimed at taking over the new equipment and coordinating the crews and subunits [26]. In February and March 2015, four tank companies, a command company and a logistics company took part in field training. It involved a total of 300 tank officers and 18 Leopard 2A5 tanks [28]. Tank officers practised taking firing positions in defence, moving to attack and laying down fire in various conditions, as well as cooperating with the logistics company. After completion of firing exercises, soldiers proceeded to undergo programme training in their Battalion. This included training using simulators in September, but also specialist field exercises, during which they performed, among others, battle marches using an observation system, with firing and directing combat. The crews of the Leopard 2A5 tanks also trained at Bundeswehr centres, namely the 393th Thuringen Low Armoured Battalion in Bad Frankenhausen in Thuringia and in Pfreimd in Bavaria [29].

On 12 October 2015, at the field training ground in Orzysz, the “Dragon-15” international manoeuvres began, continuing for two weeks. They were attended by 100 tank officers from the 34th Armoured Cavalry Brigade and involved 15 Leopard 2A5 tanks. The company, under the command of Capt. Marcin Wdowiak, was a part of the group formed by the 17th Greater Poland Mechanised Brigade [30]. During the following months, the process of training and rearming the brigade with Leopard 2A5 tanks continued.

Unexpectedly, in 2016, the Ministry of National Defence decided to withdraw Leopard 2A5s from the 34th Armoured Cavalry Brigade and direct them to the 1st Warsaw Armoured Brigade stationed in Wesoła near Warsaw. They replaced the PT-91 tanks, which were sent to the 15th Mechanised Brigade in Giżycko. Żagań, in turn, received the worn-out T-72 tanks. This decision was highly controversial among officers and national security experts due to questionable location of the unit in the context of making use of the vehicles in the event of a potential conflict, and also due to the fact that the unit was in no way prepared to receive this equipment [31]. It had no field training ground, workshop facilities, or even appropriate garages. Staff shortage was another problem. Nevertheless, the decision had its supporters. One of the greatest apologists of the new deployment of the tanks was Lt Gen. Bogusław Samol, former commander of the 10th Armoured Cavalry Brigade and the Multinational Corps Northeast. In 2018, during an interview for the Defence24 website, he said: “[...] The decision to bring the Leopard 2 tanks to Wesoła should have been made right at the moment of their purchase in 2013. The unit in Żagań which received them was never fully manned, and some soldiers were transferred to it from another brigade of the 11th Division, which lowered its combat capabilities” [32].

In 2017, over a few months, 217 tank officers were trained, and 58 tanks were directed to Wesoła: 44 Leopard 2A5s and 14 Leopard 2A4s, which became a part of the newly formed 1st Tank Battalion. On 20 December, the battalion formation process was officially completed. The second half of 2019 proved crucial in the process of building the combat capabilities of the 1st Warsaw Armoured Brigade. In late August, the Brigade was incorporated into the newly formed 18th Mechanised Division, with command in Siedlce, and in mid-November, a contract was finally signed to build 128 garages, together with servicing facilities. Finally, after two years of training and coordinating of individual elements of the 1st Battalion, at the Dęba Land Forces Field Training Centre, the subunit passed certification, organised as part of exercises codenamed “Lampart-19”. In addition to checking the qualifications of tank officers, operations at the command and staff levels were also verified. The 2nd Tank Battalion passed certification a year later, during exercises codenamed “Lampart-20”.

Conclusions

In relation to Poland's accession to NATO and the need to modernise its military equipment, but also with considerable opposition on the part of the domestic industry, between 2002 and 2003, 128 Leopard 2A4 tanks from the Bundeswehr's surplus equipment were acquired for the Polish Armed Forces. Although these tanks were not brand new, their condition was very good, and the vehicles required no major repairs for the next 10 years. This made it possible to rearm the 10th Armoured Cavalry Brigade, and also returned the Polish armoured potential to nearly 1000 vehicles.

After a dynamic and efficient introduction of Leopard tanks into the Polish Armed Forces, there was a clear decline in the operation of these vehicles and the training of crews; the acquisition of new tanks was also stopped. The ever-changing concepts and the associated lack of planned, long-term actions determined the direction of development of the domestic armoured forces for over a decade. Only between 2014 and 2015 did it become possible to acquire further 14 Leopard 2A4s and 105 newer Leopard 2A5s, which were initially sent to the 34th Armoured Cavalry Brigade, and then, a few years later, somewhat unexpectedly, transferred to the 1st Warsaw Armoured Brigade.

As shown, the acquisition of 142 Leopard 2A4 tanks and 105 Leopard 2A5 tanks, together with over a thousand other support vehicles, from the resources of the Bundeswehr, while complicated and ambiguous for some, significantly increased the Polish armoured potential. Nevertheless, this undertaking, which spanned multiple years, also revealed other, numerous problems, including those related to technical capabilities of the Polish industry, the provision of logistic support as well as insufficient servicing and training support [33, p. 162-196]. Those nearly two decades also made clearly visible the lack of continuity of actions and realisation of plans related to technical modernisation of the army, as well as their high dependence on political changes occurring in the country. The lack of clear and decisive actions in the scope of upgrading the Polish Armed Forces to 3rd post-war generation tanks and making 120 mm cannons the main weapon of Polish tanks – the omissions made in the early 21st century – now generate specific issues and problems. This is because it ultimately turned out that the number of acquired Leopard 2 tanks was too small compared to the needs and expectations. Meanwhile, while in the early 21st century it was possible to acquire as many as several hundred such machines, the used tank market gradually shrank, and after 2015, the acquisition of more Leopard 2 tanks proved virtually impossible. The result was that in 2018, a search began for another, different out of necessity, model of a Western 3rd generation tank to further reinforce the Polish armoured potential. At the same time, the much-delayed necessary upgrade of Leopard 2A4 tanks to the Leopard 2PL standard was undertaken. Unfortunately, for various reasons, this programme was significantly delayed and required numerous annexes and new schedules. Currently, the Leopard 2PL programme is being implemented. At the same time, the aforementioned attempts, started in 2018, to acquire other 3rd generation vehicles in parallel to Leopard 2 tanks, for several years brought no results. This stemmed from the fact that various concepts competed with each other and cancelled each other out: developing such a tank using the resources of domestic industry, with foreign cooperation ("Wilk"), purchasing American tanks (M1A2 Abrams) or purchasing Korean tanks (K2). The financing of such a purchase programme also remained an open question. Ultimately, in 2021, it was decided to purchase the American M1A2 tanks, to be sent to the 18th Mechanised Division, which was meant to be as compatible, in terms of equipment, with the US Army as possible. At the same time, it was decided that their purchase would be financed from

extra-budgetary resources. The outbreak of the war in Ukraine also led to a sudden activation of the Korean option, and in 2022, an agreement was concluded for the purchase of these tanks as well. Initially, they would be delivered from Korea, but their domestic production (in Poznań) is also planned in the long term. This means that in 2022, the Polish Armed Forces have been carrying out the processes of operation or acquisition and introduction into service of three different 3rd generation tanks – Leopard 2 (models A5, 2PL and A4, which is being retired), M1A2 SEP v3 Abrams and K2.

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Conflict of interests

The author declared no conflict of interests.

Author contributions

The author contributed to the interpretation of results and writing of the paper. The author read and approved the final manuscript.

Ethical statement

The research complies with all national and international ethical requirements.

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Biographical note

Grzegorz Jasiński – Doctor of Humanities in the field of history. Between 2009 and 2016, he directed the work of the Military Office of Historical Research. Between 2010 and 2016, he was the editor-in-chief of the quarterly scientific journal “Przegląd Historyczno-Wojskowy” [“Historical and Military Review”] and the annual “Kronika Wojska Polskiego” [“The Chronicle of the Polish Armed Forces”]. Since 2016, he has been working as an Assistant Professor at the Faculty of Security, Logistics and Management of the Military University of Technology. He has authored and co-authored several dozen scientific publications in the fields of 20th century history and security sciences.

Pozyskanie i wdrożenie czołgów Leopard 2A4 i 2A5 do służby w Wojsku Polskim

STRESZCZENIE

Autor na podstawie literatury przedmiotu oraz ogólnodostępnych informacji o charakterze jawnym przedstawia proces pozyskania i wdrożenia czołgów Leopard do służby w Siłach Zbrojnych RP w pierwszych dwóch dekadach XXI wieku. Weryfikuje celowość tego przedsięwzięcia, ukazując jednocześnie m.in. problemy związane z możliwościami technologicznymi polskiego przemysłu zbrojeniowego, zapewnieniem obsługi logistycznej, a przede wszystkim zwraca uwagę na tym przykładzie na brak ciągłości działań i liczne zmiany planów związanych z modernizacją techniczną armii w zakresie broni pancernej.

SŁOWA KLUCZOWE Leopard 2A4, Leopard 2A5, modernizacja techniczna, logistyka, siły pancerne

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