

Maintenance and Repair of
Defence Equipment with
the Support of the Private Sector
An Overview of the Experiences of
European Countries –
Pros and Cons

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March 2011

Contents

| | |
|--|----|
| Summary..... | 2 |
| Introduction | 2 |
| Development trends in public–private partnerships..... | 5 |
| Equipment maintenance and repair in other countries | 6 |
| General organisation..... | 6 |
| Vehicles | 8 |
| Reasons for state involvement in companies established for equipment repair activities..... | 11 |
| Human resources and state assets..... | 12 |
| Tasks and responsibilities in crisis situations and in wartime..... | 13 |
| Solution assessment..... | 14 |
| Proposals and suggestions | 16 |
| Annex I. The functions, structure and organisation of work of the Finnish company Millog | 18 |
| Annex II. The functions, structure and organisation of work of the German company HIL | 20 |
| Interviewees..... | 22 |
| Written sources..... | 23 |

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ISSN 2228-0529

Summary

Today, the Estonian Defence Forces rely mostly on in-house solutions to repair and maintain defence equipment. However, the existing infrastructure and machinery cannot cater for their long-term needs, the more so as it will be difficult to recruit and retain qualified personnel in adequate numbers in the longer perspective.

These problems are in no way unique to Estonia. Other states have faced similar challenges. Several European countries have decided to solve the problems through closer cooperation with the private sector, which is always fighting for survival through efficiency enhancements.

This report provides an overview of the general organisation of equipment maintenance and repair activities in the armed forces of some European countries, describing their experiences and analysing the positive and negative aspects of cooperation between the public and private sectors. In particular, the report focuses on the maintenance and repair of vehicles, including armoured vehicles.

Key issues:

- + Why should a state choose to cooperate with the private sector, instead of using in-house solutions for equipment maintenance and repair?
- + How do alternative forms of ownership affect military readiness?

Main conclusions:

- + A detailed analysis of current maintenance and repair activities, together with a comparison of different alternatives, would provide valuable information on the potential for efficiency enhancements.
- + Increased effectiveness and cost cutting are used by the states covered in this report to justify their partnerships with the private sector.

Suggestions:

- + Before deciding which course of action to take, the Estonian Ministry of Defence should:
 - a) carry out a detailed analysis of current maintenance and repair activities;
 - b) assess the preconditions for achieving maximum performance;
 - c) evaluate whether it would be more advantageous to conduct these activities in cooperation with the private sector or not.
- + In the case of private sector involvement in maintenance and repair of defence equipment, it would be preferable to start by finding an experienced main contractor who would seek suitable subcontractors in Estonia.
- + In the case of private sector involvement, it would be preferable to carry out a public procurement procedure for as much equipment as possible in order to maximise the chances of finding an experienced partner.

Introduction

During the Cold War era, it was general practice for armed forces to adopt in-house solutions for equipment maintenance and repair. Industrial enterprises focused on equipment development and production, while the armed forces were responsible for the upkeep of equipment. After the end of the Cold War and as a result of the defence equipment markets becoming more open, the armed forces of many countries have increasingly turned to the private sector to cater for all stages of the equipment lifecycle.

In recent years, cooperation between the public and private sectors has become widespread in numerous countries, and more companies are interested in cooperation projects. There are many reasons for this. First, large groups, which used to concentrate on domestic markets, have grown into international groups, which now offer highly specific services to the armed forces of other countries too. Second, defence budget cuts have forced many states to reduce their new equipment acquisitions. This has pressurised companies to engage more in equipment maintenance and repair activities, which have so far mostly been dominated by the armed forces. Obviously, it requires less effort to find potential service providers in other areas that are not directly linked with the core activity of the armed forces (for example, catering, transportation and publishing). Third, there have been rapid developments in weapons and technology, raising the costs of developing their maintenance systems to a very high level for the armed forces. And last but not least, the fourth reason is that after having implemented defence budget cuts after the end of the Cold War, the armed forces are interested in enhancing their operational efficiency by engaging the private sector which can, under certain conditions, organise its activities in a more cost-effective manner than the public sector.

Cooperation between the armed forces and the private sector often stems from the simple fact that some non-core activities are unavoidable for the armed forces, but at the same time are primary activities for many private companies. The execution of military operations is the core function of the armed forces; equipment maintenance and repair, together with spare parts management, are support functions. This circumstance is also often reflected in staff remuneration and motivation.

Developed countries are effecting changes in equipment maintenance activities in their armed forces with the aim of finding more cost-effective solutions. These efforts might also help Estonia to fulfil similar functions. In order to provide an overview of the solutions that have already been implemented, this report details the experiences of four European countries (Germany, Finland, Sweden and the Netherlands) and touches upon the more

general developments in equipment maintenance and repair arrangements in the armed forces of some other countries.

This report has been commissioned by the Ministry of Defence of the Republic of Estonia, which has raised the question of whether the help of the private sector could improve the efficiency of defence equipment maintenance and repair activities. Today, the Estonian Defence Forces rely mostly on in-house solutions in this field. So far, their objective has been to raise their independent equipment maintenance and repair capabilities. However, the existing infrastructure and machinery cannot cater for the long-term needs of the Estonian Defence Forces, the more so as it will be difficult to recruit and retain qualified personnel in adequate numbers in the longer perspective. In addition, there are plans to employ new equipment (including heavy armoured vehicles) in this decade, but the Estonian Defence Forces lack the expertise and experience necessary for their maintenance and repair.

These problems are in no way unique to Estonia. Other states have faced similar challenges. Moreover, the situation in some of them is exacerbated by anachronistic logistics systems that date back to the Cold War era and are based on old traditions, rather than on modern and effective management principles. Several European countries have decided to solve the problems through closer cooperation with the private sector, which is always fighting for survival through efficiency enhancements.

Development trends in public–private partnerships

The **United Kingdom** has been one of the flagship countries in using public–private partnerships (PPP). It has launched many large-scale projects since 1992, when the government introduced a programme, which later became known as the Private Finance Initiative (PFI).¹ The programme follows a cross-ministry approach, covering practically all categories of service procurement, including accommodation, equipment and training. Without involving the state, the private sector often establishes a separate undertaking (special purpose vehicle – SPV) for every project.

As part of the budget cuts which have been implemented since the end of 2010, it has been decided to privatise the Defence Support Group, which provides maintenance and repair services for the UK Armed Forces' land vehicles, aircraft, equipment and electronic systems, performs calibration procedures and fulfils other logistics support functions.²ⁱ In addition, the UK Ministry of Defence (MoD) is making preparations for the privatisation of specialised logistics support providers,³ including the Defence Storage and Distribution Agency, tasked with the transportation, storage, maintenance and distribution of the equipment and supplies of the UK Armed Forces.⁴

Since the end of the Cold War, new functions and budget cuts in the *Bundeswehr* (the Federal Defence Forces of **Germany**) have made it more interested in PPP.ⁱⁱ The *Bundeswehr* has launched major efforts in the past decade to upgrade its efficiency in various fields (catering, the management of clothing,⁵ transportation⁶ and IT support⁷). The key objectives are to reduce costs and to improve the quality of services.⁸ At the same time, it has been declared that the *Bundeswehr* ought to concentrate on military tasks and to lose its civilian tasks. This will be achieved via the implementation of three models: efficiency enhancement for in-house activities (i.e. activities carried out by the *Bundeswehr*), PPP and privatisation.

According to the PPP strategy of the **Swedish** Armed Forces, PPP projects are undertaken primarily for cost-cutting reasons and not for political or ideological ones. It is becoming increasingly common to prefer PPP alternatives over traditional in-house solutions.⁹ In the last decades, there have been several cases of handing over existing state assets to enterprises, from which operator services have been purchased (including centralised storage and distribution of spare parts,¹⁰ the repair of cryptographic equipment,¹¹ a shipyard,¹² simulators and trainer aircraft¹³). Experience has shown that despite the efforts of the Swedish Armed Forces to enhance the effectiveness of logistics

ⁱ The Defence Support Group, <http://www.dsg.mod.uk/>.

ⁱⁱ Interview, the Federal Ministry of Defence of Germany, 14.02.2011.

support as much as possible, there is still untapped potential. For example, the passing of the Muskö Shipyard into private hands has helped to increase efficiency.ⁱⁱⁱ

The **Finnish** MoD has taken an active interest in closer cooperation with the private sector only in the last decade. This is particularly evident in equipment maintenance and repair – for this purpose, an enterprise (Millog Oy) has been set up in partnership with the private sector. It is probable that Millog's example will be followed in other areas to perform various tasks in close cooperation with the private sector.^{iv}

The **Spanish** Minister of Defence announced at the beginning of 2010 that it was no longer possible to use traditional methods for the acquisition and operation of new equipment and that it would be necessary to consider private sector partnerships to reduce costs.¹⁴

The People's Liberation Army of the **People's Republic of China** revealed a new strategy in 2007, stating that the number of repair units would be reduced and that greater involvement of the private sector would be necessary to increase the Army's efficiency.¹⁵

So, it could be claimed that cooperation between the public and private sectors is becoming an increasingly widespread method for boosting the operational effectiveness of the armed forces.

Equipment maintenance and repair in other countries

General organisation

In **Germany**, maintenance and repair of the Army's equipment are carried out by Heeresinstandsetzungslogistik GmbH (HIL). HIL's owners are the Federal Republic of Germany (49%) and a holding company (51%) with three major German defence enterprises as its shareholders: Krauss-Maffei Wegmann^v, Rheinmetall Landsysteme^{vi} and Diehl Defence^{vii} (each of them controls directly or indirectly one third of the holding

ⁱⁱⁱ Interview, the Headquarters of the Swedish Armed Forces, 17.02.2011.

^{iv} Interview, the Finnish Ministry of Defence, 18.01.2011.

^v A company with 170 years of history. It started to produce defence equipment in the 1930s and MBTs in 1963. Although it was originally a producer of locomotives, it currently specialises in tracked and wheeled armoured vehicles. In 2008, its turnover was 1.4 billion euros and it employed about 3,400 people. <http://www.kmweg.de/2446-bD1lbg-~DASUNTERNEHMENKMW~KRAUSSMAFFEIWEGMANN~GeschichtedesUnternehmens~index.html>.

^{vi} A company established in 1889. In the beginning, it concentrated on weapons production. Today, the Rheinmetall group caters for both the civil sector (motor vehicles) and the military (military vehicles, ground based air defence systems). In 2009, its turnover was 1.9 billion euros and it employed about 9,300 people. <http://www.rheinmetall-defence.com/index.php?fid=683&lang=3>.

^{vii} Diehl was established in 1902. It has produced weapons since 1916. At the moment, the group's civil production includes components for the automotive and electronics industry, while its military portfolio comprises guided missiles, other ammunition, spare parts for MBTs and maintenance and repair activities. In 2009, its turnover was 2.2 billion euros and it employed about 12,200 people.

company). The adoption of a PPP-based model started in 2001, when a domestic tender was organised to find providers of maintenance and repair services for the *Bundeswehr*. This involved limited negotiations only with successful tenderers. Dealers and the umbrella organisation for the German defence industry (DWT^{viii}) were not invited to take part in the process. HIL was officially established in 2005, when it took over the first workshops from the *Bundeswehr*. Full operational capability was achieved in December 2006. Today, HIL repairs and maintains almost all of the Army's equipment, including vehicles, weapons and electronic components. HIL guarantees 70% availability^{ix} for the equipment it services. The company has about 2,200 employees¹⁶ and its annual turnover is about 250 million euros. It provides repair services for the *Bundeswehr* only. The reason behind this is partly related to the fact that HIL bears no personnel or infrastructure-related costs, which is why the provision of services to third parties would distort the market.^x

In the **Finnish** Defence Forces, third and fourth level maintenance and repair works on equipment (including weapons and electronic components) are carried out by Millog. Its majority shareholder is Patria^{xi} (55%) which, in its turn, is owned by the Finnish state (73%) and EADS (27%). Millog's other shareholders include Insta^{xii} (34%), Raskone^{xiii} (8%) and Oricopa^{xiv} (3%). The Finnish MoD owns a so-called golden share in Millog and has its own representative on its Board of Directors. In addition to equipment maintenance and repair, Millog provides the spare parts necessary for these activities (mobilisation stockpiles are still owned by the Finnish Defence Forces). The preparations for Millog's establishment were launched in 2001, when the Finnish MoD began consultations with the Finnish defence industry and trade unions. The umbrella organisation for the defence industry (AFDA) played a minor role in the consultations.^{xv} Millog became operational on January 1, 2009. In 2010, its turnover was 76 million euros and it employed 665 people, most of whom

<http://www.diehl.de/index.php?id=11&L=1>.

^{viii} Deutsche Gesellschaft für Wehrtechnik.

^{ix} 70% of the total number of all systems/items must be available at any given time. For example, if there are 100 mortars on the balance sheet, then at least 70 of them must be available at all times.

^x Interview, the Federal Ministry of Defence of Germany, 16.02.2011.

^{xi} A company with long traditions of producing defence equipment, including armoured vehicles and weapons, but also components for the aviation industry. In 2009, its turnover was 539 million euros and it employed about 3,400 people.

^{xii} Insta Group Oy is a high-tech company, which operates in both the civil and military markets. It develops network-based command and control systems and simulation systems. It is also active in the field of weapon system integration as well as command and control integration. In 2009, its turnover was 72 million euros and it employed 610 people.

^{xiii} A state-owned company, which specialises in vehicle maintenance and repair and the production of spare parts for many reputable manufacturers (IVECO, MAN, Mercedes-Benz, Mitsubishi, Renault and Sisu). In 2009, its turnover was 183 million euros and it employed 958 people.

^{xiv} A firm with a 70-year long history. It maintains, repairs and modernises weapons and training systems.

^{xv} Interview, the Finnish Ministry of Defence, 09.02.2011/15.02.2011.

were civilians. Millog may offer services to other customers too. So far, it has carried out repair works for the state-owned company Finavia, but it is also interested in providing services for the armed forces of other nations.^{xvi}

Following a Cold War tradition, the **Swedish** Armed Forces mostly prefer in-house solutions for equipment maintenance and repair. As a result of large-scale restructuring and downscaling, their workshops have substantial excess capacity, which renders the current logistics organisation ineffective.^{xvii} As most of the equipment acquired is imported and the technological complexity of equipment continues to increase, the objectives of the Swedish defence industry policy have been downgraded in order to allow Sweden not to produce and repair all of its equipment by itself and to be able to depend on foreign governments and firms.¹⁷

In the **Netherlands**, the involvement of private companies in the day-to-day operations of the Dutch Armed Forces is largely contingent on the availability of resources – their key objective is to cut costs. At the moment, the Dutch do not plan to establish joint ventures similar to those in Germany and Finland. In-house solutions are usually adopted for the Army's equipment repair activities. Maintenance and repair of the Air Force's aircraft and the Navy's vessels are carried out in close cooperation with the private sector, although the roles of the state as a commissioner and the private sector as a service provider are kept separate. In Den Helder, there is a state-owned workshop – leased to a private company – which is used for painting naval components and equipment. The workshop used to cater for the Dutch Armed Forces only, but due to spare capacity it was decided to rent it out. Its current operator may employ its spare resources to provide services for other customers.

Vehicles

In **Germany**, HIL has a remarkable repair capacity, which was developed during the Cold War, when the *Bundeswehr* operated approximately 3,500 main battle tanks (MBTs). Despite the projection that Germany will have only 395 MBTs left in 2012, HIL is currently able to perform maintenance and repair works on practically all of the *Bundeswehr's* existing vehicles, including engines, gearboxes and other components. HIL has three major workshops,^{xviii} each of which specialises in a certain type of equipment: one repairs MBTs, another deals with artillery systems and the third focuses on light armoured vehicles. If repair activities are highly specific, which is rare, they are commissioned from subcontractors (for example, the repair of the fire control computers of the *Panzerhaubitze 2000s*). Producers or subcontractors sometimes perform repair works if the HIL workshops

^{xvi} Interview, Millog Oy, 01.02.2011.

^{xvii} Interview, the Headquarters of the Swedish Armed forces, 13.12.2010.

^{xviii} Darmstadt, Doberlug-Kirchhain and St. Wendel, http://www.hilgmbh.de/de/B_02_06.html.

lack sufficient capacity. Moreover, producers play a key role in the modernisation process. In addition to the three workshops, there are service points at the *Bundeswehr* units. Some repairs works are conducted by *Bundeswehr* personnel to maintain the competences necessary to carry out missions and to fulfil war-time needs. HIL and the *Bundeswehr* support each other in training their personnel.^{xix}

As for the armoured and non-armoured vehicles of the **Finnish** Defence Forces, Millog repairs the equipment produced in the Soviet Union. If the equipment is of Western origin, more complicated repair works are commissioned from other contractors. While routine vehicle maintenance and repair works are mostly carried out by private firms, Millog focuses on major repairs, which are more time-consuming (including engines, gearboxes and axles). Millog can perform battle damage repair, routine maintenance and limited modernisation^{xx} for the Leopard 2 MBTs, acquired from Germany¹⁸ in 2003¹⁹ and in 2009,²⁰ but at the moment it is incapable of repairing components, including engines, gearboxes and electronic components. These works are commissioned from their production plants (KMW), Sweden and Switzerland. Although Millog is currently developing its repair capability for the Leopard 2s, most plans in this field are based on future Nordic cooperation. Major repairs have not been carried out on the CV-90 infantry fighting vehicles (IFVs)^{21, 22} – 102 of which were acquired from 2000 to 2007 – largely because they have been introduced only recently and the manufacturer’s guarantee is still partly valid.

When **Sweden** acquired a total of 280 Leopard 2s from Germany at the beginning of the 1990s, the procurement contract contained a clause about technology transfer. In essence, this stemmed from a tradition of the Cold War era, according to which Sweden strove for the capability to repair its own equipment as far as possible (if Sweden were currently faced with a dilemma whether to develop its independent repair capability on a similar level or not, it would quite probably not do so^{xxi}). For this purpose, the Army furnished a workshop in the city of Skövde with up-to-date technology and trained its personnel, so as to be able to carry out major repair works on Leopard 2s, including engines and gearboxes. Only the works on optronic components continue to be commissioned from the private sector (Saab). In addition, industry upgrades the MBTs, if necessary. Today, the number of Leopard 2s in the Swedish Armed Forces has dwindled to about 120 and the workshop in Skövde operates at low capacity. To prevent the staff from losing their qualifications, commissions have been accepted from other countries, including Norway, Denmark and

^{xix} Interview, HIL, 15.02.2011 (the workshop in St. Wendel).

^{xx} Finland acquired a total of 139 used Leopard 2s from Germany, of which a couple of tens were re-built into armoured vehicle-launched bridges and combat engineering vehicles, while about 15 have been used for spare parts.

^{xxi} Interview, the Headquarters of the Swedish Armed Forces, 13.12.2010.

Finland. A contract has been signed with Finland's Millog, stipulating that the Skövde workshop will carry out major repairs of the engines and gearboxes of the Leopard 2s, owned by the Finnish Defence Forces. The unit that operates the Leopard 2s in the Finnish Defence Forces does not have the capability to thoroughly test and repair their engines, gearboxes and tracks – it can only replace them. The engines and gearboxes of the PASI XA-188s, which Estonia will acquire from the Netherlands, will also be repaired in Skövde before delivery. As with their Leopard 2s, the Swedish Armed Forces have the capability to repair their CV 90-series IFVs (of which they have 509²³) independently, including major repairs of engines and gearboxes.^{xxii}

A work group at the Headquarters of the Swedish Armed Forces is currently analysing their maintenance and repair capabilities. It will table its suggestions in March 2011. Even now, the private sector is greatly interested in cooperation with the Swedish Armed Forces and, if there is spare capacity, wants to use national infrastructure, *inter alia*, for repairing civilian vehicles.^{xxiii}

The Armoured Fighting Vehicle (AFV) Sector Strategy, approved by the UK MoD in 2009, sets one key objective – to guarantee the operational sovereignty of the UK Armed Forces. In meeting their operational sovereignty needs, the UK Armed Forces will first look to the open market, and only if that market is not appropriate will they secure AFV-related capability within the UK and, if necessary, within government itself. The strategy does not entail the retention of an armoured vehicle production capability in the UK, but it states that domestic industry must be able to modify armoured vehicles to meet their needs. According to the strategy, competition should be exploited where it is the most appropriate mechanism, but where a viable competition cannot be established then the UK Armed Forces will seek value for money through the establishment of long-term partnering arrangements.²⁴

The **Dutch** Armed Forces repair and maintain their vehicles mostly by themselves, using state assets to do so. Their workshops repair the Leopard 2s, including some electronic and most optronic components. Only the engines and gearboxes of the Leopard 2s are repaired by industry. Debates are still ongoing about how to organise the repair activities for the CV-90 IFVs^{25,26} (the delivery of 193 of these started in 2007 and will be completed in 2011). At the moment, it is clear that a combination of in-house activities and industry-based solutions will be used. The organisation of repair works of non-armoured vehicles depends largely on their age. The Dutch Armed Forces prefer in-house solutions for older equipment

^{xxii} Interview, the Swedish Armed Forces, 21.02.2011.

^{xxiii} Interview, the Headquarters of the Swedish Armed Forces, 17.02.2011.

(for example, DAF), but new equipment (Mercedes-Benz and Scania) is mostly repaired by industry.^{xxiv}

Reasons for state involvement in companies established for equipment repair activities

Germany was the first country to turn to the private sector for help with the Army's equipment maintenance and repair. When HIL was established, the objective was to invite the private sector to take part in repair activities without any explicit ambition to discontinue this support function in the *Bundeswehr*. As HIL's 8-year contract will expire in 2013, a new tender is already anticipated. There are three more probable options for the future: an in-house solution (a state-owned company); a HIL-style solution with state involvement; or a long-term contractual partnership (on the basis of a service level agreement) without any state involvement.^{xxv}

The **Finnish** state is represented in Millog to exercise supervision over equipment maintenance and repair activities performed for the Finnish Defence Forces. The state does not interfere in day-to-day management of the company, but through its so-called golden share and the shareholders' agreement it retains the right to block the transfer of other shares to companies that might constitute a threat to the security of Finland. In addition, the state holds the right to redeem Millog's shares, if necessary. Still, the state's stake in the company is so small that it does not hamper the efforts of its partners to generate profit from Millog's activities. There is a minimum profitability level guaranteed for Millog and if its profits exceed the set limit, they are divided between the Finnish Defence Forces and Millog.^{xxvi}

The German and Finnish solutions seem to be sensible and logical because private sector partners were found in both countries essentially without open competition, which meant that the lowest possible price was not guaranteed in any way. This shortcoming is compensated by state involvement and by regulating the generation and the sharing of profits. An equal division of profits between the state and its private sector partners enables the state to make money from the more effective management practices of the private sector on the one hand, and gives the private sector a chance to earn a profit and highlight its presence in the domestic market on the other.

^{xxiv} Interview, the Dutch Defence Materiel Organisation, 22.02.2011.

^{xxv} Interview, the Federal Ministry of Defence of Germany, 16.02.2011.

^{xxvi} Interview, the Finnish Ministry of Defence, 18.01.2011.

Human resources and state assets

In **Germany**, the staff of the workshops have not become HIL's employees, but continue to be employed by the *Bundeswehr*, which pays their wages. Similarly, state assets have not been transferred to HIL. The *Bundeswehr* covers the upkeep costs of infrastructure. In its repair activities, HIL uses the *Bundeswehr's* spare parts. The spare parts that are purchased by HIL are automatically transferred to the *Bundeswehr's* ownership. Upon the expiration of HIL's contract, all the personnel and assets will be re-assigned to the *Bundeswehr*, although the contract fails to outline the exact details of this arrangement.^{xxvii} Consequently, it could be claimed that HIL is a company that provides management services. The state has placed its resources – state assets and personnel – at the disposal of HIL's leaders who manage them more effectively than the *Bundeswehr* (as is typical of and expected from the private sector).

In **Finland**, the staff are employed by Millog and their employment contracts with the Defence Forces were terminated. Millog uses the real estate assets owned by the state via a company similar to Riigi Kinnisvara AS in Estonia called Senaatti and the Finnish Defence Forces used to lease real estate from it. In connection with restructuring, the rental contracts were reviewed and now Millog is the lessee. Other fixed assets whose value exceeded 50,000 euros, were purchased by Millog from the Finnish Defence Forces.

As a rule, the **Swedish** Armed Forces do not transfer state assets to private ownership, but prefer to rent them out or to grant the right to use them free of charge. In essence, they carry out a tendering process and the winner must operate the asset (for example, a shipyard, a simulator or a centrifuge) and provide services related to this asset to the Swedish Armed Forces. This solution has one major advantage: the state denies a private company the attainment of a monopoly position, the more so if a relatively short term contract is concluded. So, the state preserves the opportunity to reclaim the assets from its partners, to find more profitable alternatives or even to opt once again for in-house solutions. Unlike tangible assets, the workforce of the Swedish Armed Forces is handed over to its private sector partner in full, which allows the latter to raise the efficiency of its operations after some time by optimising its staff numbers.^{xxviii} At the same time, minimum key competences are retained to enable the state to define its needs and to act as an 'intelligent customer' in the future.

The **Dutch** keep their assets in state ownership. Operators lease state-owned infrastructure and equipment. In terms of personnel, the Dutch Armed Forces follow the principle that they must be able to independently perform a part of maintenance and

^{xxvii} Interview, the Federal Ministry of Defence of Germany and HIL, 14.–16.02.2011.

^{xxviii} Interview, the Headquarters of the Swedish Armed Forces, 17.02.2011.

repair activities in the future because in the case of foreign missions, 100% reliance on private companies cannot be tolerated. The reason for this is that unless a state of war has been declared, private companies may breach their contracts to save the lives and to protect the health of their employees, paying a penalty for doing so, which would not be acceptable for a unit on a mission. In addition, it is considered to be vital that the Dutch Armed Forces retain sufficient competences that would allow them to define their future technical needs for their equipment's entire life-cycle.^{xxix}

Tasks and responsibilities in crisis situations and in wartime

In crisis situations, the Finnish company Millog distributes sets of spare part to military units. In wartime, Millog carries out equipment repair works (including battle damage repair). All maintenance activities are suspended, meaning that Millog's repair capacity increases significantly. Some members of its staff are mobilised to serve in the Finnish Defence Forces as reservists and to engage in repair activities up to brigade level.

In Germany, the *Bundeswehr* focuses on peacetime training and foreign missions, which is why crisis and wartime scenarios do not seem to be thought through in sufficient detail. What is clearly defined, however, is the legal framework in wartime – the state holds the right to take over private companies, if necessary. As for its equipment, the *Bundeswehr* is forced to maintain an independent capability to provide continuous logistics support to foreign missions because the state has no right to order companies around in peacetime, but is bound by contracts.

^{xxix} Interview, the Dutch Defence Materiel Organisation, 22.02.2011.

Solution assessment

This assessment covers the equipment maintenance and repair solutions adopted by Germany, Finland, Sweden and the Netherlands.

In Germany, 49% of HIL's shares are in state ownership, while 51% are in private hands. The profit sharing scheme is based on a 49/51 arrangement, but 50% of total profits are retained in the company and only 50% are paid out as dividends. According to the Finnish system, however, the private sector partners receive all the profits up to a certain limit. If they pass the limit, the profits are split 50-50 between the Finnish MoD and the private sector partners. So, it could be claimed that the Finnish system motivates the private sector partners to make slightly more efforts to generate profits because if they do not exceed the set limit, everything they earn is paid out to them in full as dividends.

In Finland, the Army's equipment maintenance and repair tasks are divided between Millog and the Finnish Defence Forces – the workshops of military units are operated by the units themselves, while the rest falls under Millog's area of responsibility. The German system is, in a way, less complicated and more transparent because all levels of the Army's maintenance and repair tasks have been handed over to HIL. The Finnish scheme is justified by the fact that the Finns need to retain the repair competences of their units because in wartime the Finnish Defence Forces carry out repair activities by themselves up to brigade level. At the same time, the *Bundeswehr* also has to maintain its independent repair capability at a certain level, which is why it undertakes training and practice in cooperation with HIL. The two approaches are therefore quite different, while the German one seems to be slightly simpler and clearer.

In addition to equipment maintenance and repair, Millog also manages the spare parts of the Finnish Defence Forces, including those owned by the state. In Germany, HIL does not have a similar function, although it is no longer fulfilled by the *Bundeswehr*, but by a company called Zebel, which was especially set up for this purpose. Spare parts management is closely linked to day-to-day maintenance and repair operations. For this reason, it would be logical to view maintenance, repair and spare parts management as an integrated whole, based entirely on either an in-house solution or cooperation with the private sector.

Sweden developed its repair capability during the Cold War and its upkeep on the current basis is not economically effective. Economic efficiency can only be achieved if services are offered to other customers too. For this reason, cooperation with private sector partners that have the opportunity to generate profits is the most reasonable solution.

The Dutch Armed Forces did not have a fully independent repair capability during the Cold War – they used an already established combined solution: some of the equipment maintenance and repair tasks were fulfilled in cooperation with the private sector, while others were performed in-house. Today, there is a variety of cooperation activities carried out with the private sector, from ordinary service provision to government-owned/contractor-operated (GOCO) arrangements. In the future, the private sector's contribution to maintenance and repair activities will probably increase, rather than the opposite.

The German and the Finnish solutions presume that customers have developed advanced planning and implementation capabilities because their systems are based on trust and long-term partnerships. Customers who are capricious and change their minds frequently do not motivate private sector partners. If Estonia adopted a similar system, this would involve an adjustment of the current mental model and a shift in focus from planning to the more consistent implementation of the plans that have been adopted.

In itself, structured cooperation with the private sector need not affect military readiness in a positive or negative manner. If there is an adequate legal framework, which provides for the fulfilment of the private sector's obligations also in crisis situations and in wartime on the one hand, and enables the private sector to perform its tasks on the other, then military readiness depends on the resources allocated to the logistics system. If cooperation with private sector partners makes it possible to improve efficiency, it might also increase military output under limited resource conditions.

Proposals and suggestions

1. The definition of state interests

It is crucial that the state – the contracting entity – defines its interests, as it does in the case of ordinary public procurements. What are the equipment maintenance and repair needs of the Estonian Defence Forces in peacetime, in crisis situations and in wartime? So far, Estonian enterprises and the Estonian Defence Industry Union have held the initiative to a certain extent. Experience in defence R&D shows that the Ministry of Defence of the Republic of Estonia cannot continue to reject all proposals made by potential partners. In the worst case scenario, the MoD will find itself in a situation where it will conclude a disadvantageous agreement with a contractor because it has not clearly defined its actual needs.

2. The identification of problems

In addition, it is necessary to exactly identify the problems concerning the current arrangement of equipment maintenance and repair activities in the Estonian Defence Forces and to raise awareness about these problems as much as possible in the MoD's entire area of government. Otherwise, the whole process of maintenance and repair optimisation will suffer.

3. The consideration of alternative solutions

It is certainly useful to consider various alternatives to the current maintenance and repair system. First, the two main alternatives – cooperation with the private sector and the present in-house arrangement – have to be rendered comparable. If the maintenance and repair activities of the Estonian Defence Forces are not clearly defined (for example, if some workshops have not mapped their work processes) and/or if the processes are inefficient, a comparison of solutions cannot be performed before the drafting of a detailed plan to transform the existing system to gain maximum effectiveness. Only then will it be expedient to consider whether the involvement of the private sector will help to reduce operating costs. Unless this is done, conducting a public procurement or finding private sector partners by other means will not be possible. It is clear that this analysis will be useful, even if it turns out that a modified and enhanced in-house solution is the most convenient one.

4. The introduction of a PPP scheme

The principal reason for organising equipment maintenance and repair activities in the Estonian Defence Forces together with the private sector lies in the need to ensure the utilisation of equipment acquired for taxpayers' money for as long as possible and at minimal cost. The private sector's contribution to this cooperation would be its cost-

effective thinking and its documented expertise in organising maintenance and repair works on complex equipment (including tracked armoured vehicles, optronic and electronic components). It would be preferable if the MoD found an experienced main contractor who would seek suitable partners and subcontractors in Estonia. In addition, this approach would enable the mitigation of the risk of corruption. It is similar to the principles underlying the Estonian offset system – the MoD does not choose the Estonian partners for a foreign firm; instead the foreign firm picks its own cooperation partners to achieve the most optimal solution. Moreover, an experienced partner could support the MoD and the Estonian Defence Forces in fulfilling the objectives set out in the Estonian Long-term Defence Development Plan 2009–2018²⁷ by focusing on how to create conditions conducive to equipment provision. Due to current personnel and infrastructure restrictions, it is impossible to provide logistics support for most of the capabilities that are being developed (for example, medium-range air defence capability and armoured manoeuvre capability). It would therefore be reasonable to seek the help of private companies that have the skills and expertise necessary for the building of new capabilities.

5. The scope of maintenance and repair analysis (horizontal and vertical)

It would be practical to analyse maintenance and repair activities on an integrated and all-inclusive basis (on the horizontal plane) – i.e. to cover not only heavy vehicles, but as many areas as possible (including weapons, optronic and electronic components) – because contemporary systems include a wide range of components. The Finnish MoD, the German Federal MoD and the Headquarters of the Swedish Armed Forces also recommended this. In addition, it would be wise to add depth to the analysis (on the vertical plane) and to conduct maintenance and repair activities at suitable military units, taking into account their current and future conditions in terms of personnel and infrastructure. Moreover, it would be worth considering whether equipment maintenance and repair for the Estonian Defence League should also be carried out on a similar basis because its equipment is to a great extent the same as that of the Estonian Defence Forces. There is no need for the Estonian Defence League to develop its own maintenance and repair capabilities, as they would largely duplicate the analogous capabilities of the Estonian Defence Forces.

6. The transfer of state assets

In order to leave the state wide powers of discretion in deciding whether to change its partners in the future, it would be better to avoid the transfer of state assets to private ownership. In principle, the state should find an operator who would use state assets (for example, workshops) to offer related services to the Estonian Defence Forces. This solution has a major advantage: the state does not allow anyone to attain a monopoly position, while it retains the flexibility to change the respective arrangements in the future.

Annex I. The functions, structure and organisation of work of the Finnish company Millog

In peacetime, Millog conducts equipment maintenance and repair activities (second level according to the Finnish system), procures and distributes spare parts for the Finnish Defence Forces and manages both the spare parts that are more widely used in peacetime and the sets of spare parts for wartime use, which constitute state assets. In peacetime, members of the Finnish Defence Forces do not work for Millog, except for a few liaison officers who represent them in Millog.

As for the armoured and non-armoured vehicles, Millog repairs the equipment produced in the Soviet Union. If the equipment is of Western origin, more complicated repair works are commissioned from other contractors. While routine vehicle maintenance and repair works are mostly carried out by private firms, Millog focuses on major repairs, which are more time-consuming (including engines, gearboxes and axles). Millog can perform battle damage repair, routine maintenance and some minor modernisation procedures for the Leopard 2 MBTs, but at the moment it is incapable of repairing components, including engines, gearboxes and electronic components. These works are commissioned from their production plants (KMW), Sweden and Switzerland. Although Millog is currently developing its repair capability for the Leopard 2s, most plans in this field are based on future Nordic cooperation.

Millog has concluded framework agreements with companies for the delivery of equipment maintenance and repair works. On the basis of these agreements, garrisons can themselves procure services at negotiated prices. Before the establishment of Millog, the garrisons of the Finnish Defence Forces had about 500 agreements with various companies; now, Millog has about 45 framework agreements (15 of which concern vehicles), which guarantee the provision of the same services to the garrisons. The volume of every single agreement has increased, which has also lowered the price level. However, if Millog-style arrangements are preferred, customers must be able to define their needs very accurately (to act as 'intelligent customers').

Currently, Millog issues invoices for maintenance and repair works on the basis of the working hours spent on every item repaired or maintained. In the near future, it is planned to adopt a new policy based on fixed prices – customers will always pay the same price for a standard service, regardless of the specific time spent on the repair or maintenance of an item. This approach will facilitate the budget planning processes of both Millog and the Finnish Defence Forces. In the next stage, it is planned to transfer to a system based on

guaranteed availability – Millog will guarantee the availability of a certain percentage of equipment. Such a system has not been implemented earlier because there has not been sufficient historical data on equipment usage by the Finnish Defence Forces.

Millog procures spare parts for the garrisons' workshops on a centralised basis in accordance with the orders placed by the units of the Finnish Defence Forces. 75% of Millog's spare parts procurements are allocated to garrisons; the remaining 25% are used by Millog in its repair activities.

The Finnish Defence Forces and Millog have adopted the following investment allocation model. The Finnish Defence Forces procure more expensive equipment and tools (those costing more than 50,000 euros). Every procurement of this kind must be preceded by a thorough analysis, which must answer, *inter alia*: will it be a sound investment? What will its advantages be over a modernisation package? Should the whole system be replaced with a new solution? Equipment and tools procured are retained in state ownership because the Finnish Defence Forces will need them in crisis situations and in wartime. Millog purchases less complex equipment and tools (those costing less than 50,000 euros) that are necessary for peacetime operations. Economic expediency is the key factor in making investments: if an investment produces a return, for example, after five years, it will be given the green light; if no return is to be expected even after ten years, the idea to invest will be dismissed.

This annex is based on written sources and on the interviews conducted with the representatives of the Finnish Ministry of Defence, the Finnish Defence Forces and Millog.

Annex II. The functions, structure and organisation of work of the German company HIL

HIL was established in cooperation with the private sector in order to guarantee the fulfilment of five objectives:

1. To ensure the availability of equipment;
2. To cut equipment maintenance and repair costs;
3. To sustain the *Bundeswehr's* core capabilities;
4. To retain the defence industry's competences in technology provision;
5. To support a smooth transfer of civilian personnel to the new structure of the *Bundeswehr*.

HIL carries out second to fourth level maintenance and repair works on the Army's equipment and procures spare parts. It also repairs and maintains equipment that is used by all services (for example, terrain vehicles and small arms). Most of HIL's personnel are civilians who are employed by the *Bundeswehr*.

In principle, HIL can perform maintenance and repair works on practically all of the Army's equipment, excluding some electronic and communications equipment. Seasonal changes in workloads and capacities, however, make it necessary to outsource some works from subcontractors. HIL is able to carry out major repairs of engines, gearboxes and axles.

About 50% of HIL's turnover comes from three private company shareholders, from which it buys spare parts and other services. Transactions with other companies provide the remaining 50%. HIL's equity capital is negligible. It acquires current assets by issuing invoices to its customers with a due date of 30 days, while its suppliers use a due date of 60 days. HIL adheres to the Public Procurements Act – as is required, according to German legislation, of a company, in which the state has a larger share than 33%.

HIL's staff have access to state secrets on different levels. No restrictions have been imposed on the basis of citizenship. Although only German citizens can serve in the *Bundeswehr* (most of HIL's staff are employed by the *Bundeswehr*), the German Federal Minister of Defence made a proposal as recently as February 2011 to allow EU citizens to serve in the *Bundeswehr*. In principle, the legal framework in wartime allows the state to expropriate the shares owned by its private partners.

The availability of about 6,200 different systems/items, from armoured vehicles, artillery systems and heavy vehicles to small arms and NBC protective equipment, is guaranteed to

the Army by HIL – 70% of the total number of all systems/items must be available at any given time.

A short while ago, HIL submitted its proposals about the future to the German Federal MoD:

1. The availability percentage should depend on actual needs. For example, army schools often require a higher percentage to function properly, while some military units remain quite indifferent to availability during the holidays.
2. In the future, HIL (or its successor) should repair and maintain all the equipment of the Army. If a unit is maintained at high readiness, all equipment must be available, not only, for example, vehicles and weapons.
3. A system based on fleet management should be introduced. As a result, units will not have their own equipment; instead, equipment will be hired out to them. However, HIL conceded that this idea might not be psychologically acceptable to unit commanders.
4. In addition, HIL would like to be in charge of the management of spare parts, which would create an integrated system together with its maintenance and repair functions.

The establishment of HIL has allegedly led to even greater savings than initially expected: from 2005 to 2013 about 400 million euros were saved, instead of the 250 million euros planned. However, it is difficult to make exact estimates about cost cutting because there was no guaranteed equipment availability before HIL's time. Equipment stocks were large; most of them were stored in warehouses where mobilisation stockpiles were amassed. For example, if an MBT became faulty during training, you could always go and pick another one. In connection with downsizing the military in the 1990s, a lot of equipment was transferred to new owners, which made it necessary to use the remaining equipment more intensively. This, in its turn, created a greater need for equipment availability. And that was when HIL was established.

This annex is based on written sources and on the interviews conducted with the representatives of the Federal Ministry of Defence of Germany and HIL.

Interviewees

In alphabetical order:

Johannes J Austen, the General Staff of the *Bundeswehr* of Germany

Theo Averkamp, Heeresinstandsetzungslogistik GmbH

Thomas Cederborg, the Headquarters of the Swedish Armed Forces

Jan Ericsson, the Headquarters of the Swedish Armed Forces

Karl-Jens Gruber, the General Staff of the *Bundeswehr* of Germany

Dirk Jan Habig, the Dutch Defence Materiel Organisation

Peter Holmqvist, the Swedish Armed Forces

Heiki Härtsiä, Millog Oy

Tarja Jaakkola, the Finnish Ministry of Defence

Mats Josell, the Headquarters of the Swedish Armed Forces

Jan T Knoph, the Headquarters of the Swedish Armed Forces

Kimmo Myllyoja, Millog Oy

Aarne Nieminen, Millog Oy

Raimo Petäsno, the Finnish Defence Forces

Kalervo Raunama, the Finnish Defence Forces

Helmut Rempl, the *Bundeswehr* of Germany

Detlef Scheuer, the General Staff of the *Bundeswehr* of Germany

Sanna Sillman, Millog Oy

Christian Wilhelm, Heeresinstandsetzungslogistik GmbH

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