

OKLEPNI TRANSPORTER ALI BOJNO VOZILO PEHOTE V SREDNJI BATALJONSKI BOJNI SKUPINI

ARMOURED PERSONNEL CARRIER OR INFANTRY FIGHTING VEHICLE IN A MEDIUM INFANTRY BATTALION GROUP

Povzetek V članku je predstavljen poseben izziv, ki mu je, po mnenju avtorja, izpostavljena Slovenska vojska z novim paketom ciljev zmogljivosti 2017. Ta namreč predvideva vzpostavitev srednjih bataljonskih bojnih skupin (SrBBSk) z vozili, ki so opremljena s 30 mm topom. Srednja bataljonska bojna skupina predvideva opremljenost z oklepnimi transporterji, zato njeno bojevanje temelji na manevru izkrcane pehote, ne pa na samostojnem bojevanju vozila, ki pehoto izkrca le, če je treba. V tej luči vsebuje opremljanje vozil s 30 mm topom nekaj strokovnih neznank. Menimo, da bo treba za take srednje BBSk najti drugačne doktrinarne rešitve, ki pa jih v Slovenski vojski trenutno nimamo. Nekatere možnosti predstavljamo v tem članku.

Ključne besede *Slovenija, Slovenska vojska, srednja pehota, srednja bataljonska bojna skupina, bojno vozilo pehote, 30 mm top.*

Abstract This article highlights a specific challenge brought into the Slovenian Armed Forces with the latest NATO Capability Targets 2017. This calls for the delivery of Medium Infantry Battalion Groups, equipped with Infantry Fighting Vehicles (IFVs) mounted with cannons. The Medium Infantry Battalion Group, according to the latest NATO capability codes and capability statements (2016), is to be equipped with armoured personnel carriers; consequently its manoeuvre is based on dismounted infantry and not the vehicle. In light of that, equipping the Medium Infantry Battalion Group with a 30mm cannon presents some issues. We need to have a clear doctrinal answer on its employment. Some of the options are presented in this article.

Key words *Slovenia, Slovenian Armed Forces, medium infantry, medium infantry battalion group, infantry fighting vehicle, 30 mm cannon.*

Introduction

In 2017 Slovenia received¹ new Alliance Capability Targets with Medium Infantry Battalion Groups (INF-M-BNG) at their centre as the most militarily relevant capabilities. The Slovenian Armed Forces (SAF) plan to have these equipped with (wheeled) infantry fighting vehicles (IFV), mounted with 30mm cannons (Kralj, 2017, p.34). That, however, opens a range of questions linked to SAF budgetary issues and, from our point of view even more importantly, the doctrinal use of such vehicles.

The existing wheeled 8x8 vehicles in the SAF (Patria AMV–Svarun) are by definition armoured personnel carriers (APC) armed with 12.7mm machine guns or a 40mm grenade launcher. With regard to ballistic and mine protection they do however exceed the minimum alliance requirements for medium units.²

This article first attempts to establish a doctrinal difference between APCs and IFVs, since there is none in either the Alliance or SAF doctrine. The article also presents the Alliance's doctrinal requirements for INF-M-BNGs, with an emphasis on their vehicles, where there are several terminological issues. This serves as a base for a discussion on the dilemmas which the 30mm cannon brings to the INF-M-BNGs concept. We finish by proposing solutions to the issues revealed.

1 DEFINING THE ARMoured PERSONNEL CARRIER OR INFANTRY FIGHTING VEHICLE

The first armoured vehicles appeared on the battlefield during the First World War, as heavy tractors pulling artillery pieces, and as rudimentary tanks. Following the First World War technology and doctrine development revolved primarily around tanks. However, it was not long before it was established that tanks on the battlefield need infantry support, and that following fast-moving tanks around the battlefield poses a serious problem for the "less mobile" infantry. A unique Soviet Second World War II solution where the infantry rode the tanks around the battlefield proved unacceptable due to the heavy losses the infantry suffered in chance encounters with the enemy (Dragojević, 1986, p.48).

The industry's first response to the needs of the infantry came in the form of half-trucks (e.g. the German Sd.Kfz 251 and American M2) and light wheeled reconnaissance vehicles (e.g. the Sd.Kfz 231 and M8 Grand). These first vehicles were effective in their main purpose of providing infantry mobility, making it available to tanks when needed, while at the same time providing some armoured protection during transport.

Following the Second World War, the development of the infantry armoured vehicle followed the development of tanks in two general directions. The first

¹ Through NDPP, which basically means they were agreed upon by both sides (NATO and Slovenia).

² Medium Infantry Battalions equipped with APCs are the base around which INF-M-BNGs are developed, according to CC&CS 2016.

followed the half-truck tradition of providing battlefield taxis, while the second followed the identified need in the 1960s of a closer cooperation between tanks and infantry, with the resulting infantry vehicles participating in armoured combat (Dragojevič, 1986, p.52). This difference, of providing infantry transport around the battlefield, with infantry fighting dismounted and participating in armoured combat with tanks, is the first and main difference between APCs and IFVs. And as we understand it, this is also the basic difference between motorised infantry (equipped with APSs) and mechanised infantry (equipped with IFVs). However, technology improvements in recent decades have blurred the lines, and one cannot even find a generally accepted definition of what is an APC and what is an IFV. The closest we have come to a generally accepted definition of both can be found in the Conventional Forces in Europe Treaty. The Treaty defines an APC as "...an armoured combat vehicle which is designed and equipped to transport a combat infantry squad and which, as a rule, is armed with an integral or organic weapon of less than 20 millimetres calibre." (OSCE, 1990, pp.3-4) The same Treaty defines an IFV as "... an armoured combat vehicle which is designed and equipped primarily to transport a combat infantry squad, which normally provides the capability for the troops to deliver fire from inside the vehicle under armoured protection, and which is armed with an integral or organic cannon of at least 20 millimetres calibre and sometimes an antitank missile launcher." It also states that IFVs "... serve as the principal weapon system of armoured infantry or mechanised infantry or motorised infantry formations and units of ground forces," (OSCE, 1990, p.4). However, the treaty does not provide a definition of armoured, mechanised or motorised infantry.

NATO has no definition of different types of vehicles. It does however have a description of different unit type capabilities, which dictate the capabilities of the vehicles in these units. They can be found in the NATO Capability Codes and Capability Statements (CC&CS). To understand what type of vehicles one should find in these units we must take a look at CC&CS in conjunction with STANAG 4569, describing the required combat power and armoured protection at different levels. There are however also some terminological gaps in the Alliance documents and doctrine that are causing professional conflicts. The 2016 NATO CC&CS talks of armoured, mechanised and motorised infantry within the framework of heavy, medium and light battalions. It is clear from ATP 3.2.1 and the 2016 CC&CS that heavy infantry is designed to fight with tanks, medium infantry is designed as an intermediate between heavy and light with an emphasis on battlefield and operational agility, and light infantry is designed for strategic mobility and fighting in close terrain (ATP 3.2.1, 2009, pp.3-2, 3-3).

The US reference in relation to the APC/IFV difference states that "any IFV must be able to carry a team or squad and have the three following characteristics:

- Lethality of a medium cannon or automatic grenade launcher,
- Protection against machine guns,
- Mobility to move off-road with tanks and fire weapons on the move.

If an infantry carrier cannot meet any of the above capabilities, it is not an IFV... Adding a medium cannon to a light-armoured wheeled APC does not make that vehicle an IFV, because it may not be able to accompany tanks, fire on the move, or survive first contact with the enemy,” (TRADOC, 2011, pp.3-1 in 3-2).

In conclusion we can establish that the APCs primary purpose is to transport infantry and not to fight. Units equipped with APCs conduct dismounted manoeuvre. On the other hand the IFV’s primary purpose is to conduct mounted manoeuvre and to fight with tanks. They will only dismount the infantry for close protection or when IFVs are unable to execute a task. The key to understanding the difference is to look at the vehicle through the elements of firepower, protection and mobility. IFVs are equipped with cannons (20mm or more) and have the capability to fire anti-tank guided weapons. They also have a minimum of K5/Mb3 level of protection (STANAG 4569)³. IFVs are capable of good off-road mobility, and above all are capable of following tanks in all terrains. However, regardless of the APC/IFV definition, if these three elements are not properly balanced, the system as a whole is exposed to increased risk. The doctrinal use of the vehicle needs to be adapted to the weakest of the three elements.

2 MEDIUM INFANTRY BATTALION GROUP CAPABILITIES

The Slovenian Armed Forces have already developed and affiliated a Light Battalion Battle Group into the NATO force structure. With the 2013 Capability Goals, the SAF planned to have one motorised (previously light (2008)) and one mechanised (previously medium (2008)) Battalion Battle Group. In 2017 the SAF were given a new set of capability goals with two INF-M-BNGs at their centre. It would seem that the SAF was given a more demanding goal to reach. However in this regard we are no exception in the Alliance. The changed geopolitical environment dictates strengthening the Alliance’s capabilities of fighting in high-intensity conflict.

However, at this point a detailed analysis of the Alliance’s INF-M-BNG requirements is necessary. The capstone capability for the INF-M-BNG is: “Capable of conducting land tactical activities alone and manoeuvre under fire to engage or defeat the opposing force by being organised as a combined-arms and battalion-sized force and by exploiting Armoured Personnel Carriers (APC) or medium/heavy Protected Patrol Vehicles (H/M-PPV) that will provide protected mobility and some fire support to ensure tactical and operational mobility” (CC&CS, 2016, p.67)⁴. Connecting this to the Medium INF BN requirements and STANAG 4569, this means that at a minimum the vehicles need to provide a K3/Mb2⁵ level of protection. At the same time the CC&CS also demands that the

³ 25 mm automatic cannon/155 mm artillery bursts at 25m and under belly 8 kg Blast AT Mine explosions

⁴ The framework unit for INF-M-BNG is a Medium Infantry Battalion as defined by CC6CS 2016 (pp.64-65)

⁵ 360° protection from sniper rounds 7;62x54R and 155mm fragments at 60m; and 6 kg AT mines under the center of the vehicle

Medium INF BN employs vehicle-mounted direct fire weapons to destroy enemy lightly armoured vehicles protected up to K3 level (STANAG 4569), and neutralise/suppress dismounted infantry at ranges beyond 200m. This of course means that the capabilities required of INF-M-BNG demand an APC and not an IFV. This is, at the same time, in line with ATP 3.2.1., which dictates medium infantry doctrine for NATO and requires medium infantry to fight predominately dismounted with the manoeuvre based on dismounted infantry and not the vehicle. This however is an important difference with regard to the previous Slovenian Capability Goals, which required the SAF to set up a mechanised infantry battalion group, based on IFVs; therefore SVN has actually been given “lighter” goals than previously.

However, based on available information, the SVN Capability Goals must have an additional requirement regarding the vehicle’s armaments. The SAF apparently plans to equip its INF-M-BNG vehicles with 30mm cannons (Kralj, 2017, p.34). Since the Capability Goals are unlikely to require all the vehicles to be equipped with cannon, we believe this was an internal SAF decision.

We believe this latter fact poses a serious dilemma for the SAF. This dilemma is not new, and nor is it specific to the SAF. The US Army established that the Russian Federation is equipping its Stryker equivalent with a 30mm cannon. This led to a demand that Strykers also be equipped with a 30mm cannon (Gregory, 2017). The adaptation process was fairly quick and the first US Army Stryker units in Europe are already equipped with 30mm Stryker vehicles. This being said, it is very clear to the US Army that such a Stryker is not meant to engage in decisive combat with enemy armoured or mechanised units, and that the conversion was done in a way that the vehicle has retained all the capabilities of dismounted infantry it had before (Judson, 2017). Some have also pointed out the possible disadvantages of such a conversion. There is a strong possibility that due to the conversion the vehicles will be doctrinally misused, as even the old Strykers are often misused (King, 2017). The US Army doctrine states: “By design, the Stryker family of vehicles does not have the level of protection to fight against heavily armoured vehicles. This concept is still true for the MGS (Mobile Gun Systems) ... they must rely instead on their mobility and manoeuvrability in coordination with other units to effectively engage targets and then displace. They cannot exchange fire with armoured fighting vehicles and expect to survive the engagement” (ATP 3-21.91, 2017, pp.1-7). None of the sources available state that the up-gunned Strykers would also be getting an increase in armour protection. The Stryker is an Infantry Carrier Vehicle or basically a classic APC, and is not meant to fight enemy vehicles. It was therefore conceptualised with an appropriate armament, armour and mobility (King, 2017). Its main advantage is strategic and operational mobility.

We also believe that the Russian BPM-97, which was used as a reason for up-gunning the Strykers, is not in the same category as the Stryker. The literature states that BPM-97 is a Russian border guards vehicle. It is supposed to have STANAG 4569 Level K4 armour protection, a V-shaped hull and a 30mm cannon

(http://www.military-today.com/apc/bpm_97.htm). This is supposed to make it an IFV, but the fact that it is a wheeled 4x4 and designed for a border guard role make it incomparable to the Stryker family of vehicles. This is similarly incomparable as the French VBR 4x4 (with 20mm cannon and K4 protection) and the Stryker. The VBR is a reconnaissance vehicle, and the Stryker an APC (Jane's, 2011, p.225).

The NATO Alliance has no definition of an IFV as a tracked vehicle, but it does have a clear requirement for an IFV to be able to fight with tanks. Wheeled 8x8 vehicle technology is supposed to make them capable of following tanks, but praxis does not show this to be a reality in any country. We believe that the off-road mobility of 8x8 vehicles is not up to the requirements of tracked vehicles.

When we consider adding an armament to a certain type of vehicle, we need to know exactly what is its intended role and the potential threats it could face. Based on this, we need to properly balance the elements of firepower, protection and mobility. World's Armed Forces inventories are full of wheeled vehicles with 20mm+ cannons; the Pandur II, Partia AMV, VBCI, Centauro VBM, BTR-90, Lazar, Ratel IFV, and MOWAG Piranha IV. All of them have the capability to upgrade their off road capability and armour protection to K4/K5 level. The industry also calls them IFVs, but we believe they are incapable of fighting with tanks and are therefore not real IFVs. Their manoeuvre is still based on dismounted infantry. The cannon is only an expensive bonus.

3 MEDIUM INFANTRY BATTALION GROUP VEHICLES

According to CC&CS2016, medium infantry battalions are based on mechanised infantry in APCs. However, there is a requirement in the Slovenian Capability Targets 2017⁶ for cannon on INF-M-BNG vehicles. From our point of view it is pointless to have a 30mm cannon on an APC if it is unable to provide a corresponding level of protection and mobility. An APC with a 30mm cannon cannot be used as an IFV to fight with tanks or against enemy IFVs or to defeat enemy strongpoints because it lacks the necessary protection and mobility and will therefore always be on the losing side. However, if such a vehicle is used as an APC we are not fully exploiting the potential of its cannon, and are therefore hard-pressed to justify the sense of a rather large investment into such a vehicle⁷.

⁶ *Since the NATO CAPABILITY TARGETS 2017 for Slovenia is a classified document, and therefore unavailable, we can only deduce that this requirement must be in it since there is no such requirement in any of the UNCLASSIFIED or doctrinal documents. In addition we have several sources stating that a cannon is a NATO capability requirement (e.g. MMC RTV SLO, 2018 and Mikelj, 2018). Since the required capabilities for each individual nation are defined in the NATO CAPABILITY TARGETS we can assume that a 30mm cannon requirement is contained within them.*

⁷ *According to available internet data (www.army-guide.com) the cannon-equipped turret price is somewhere between 10% and 25% of the vehicle price, depending on the type of turret and cannon..*

The way the SAF seems to understand mechanised infantry is in collision with NATO's understanding of it. The Yugoslav People's Army (YPA), where most of the SAF armoured officers were schooled, understood mechanised infantry as an integral part of an armoured unit. It was therefore equipped with IFVs, to fight alongside tanks. APCs, in YPA doctrine, were the domain of a motorised infantry (SSNO, 1976, p.11).

NATO, however, has a different doctrinal stand on mechanised infantry. Based on ATP 3.2.1 and CC&CS 2016 it is clear that in NATO the infantry in both APCs and IFVs is treated as mechanised. Further, there are no requirements in NATO for all vehicles in manoeuvre units of the medium infantry to be equipped with cannons, and there is also no requirement for the medium infantry to be equipped with IFVs – IFVs are only required in heavy infantry units. In fact NATO medium infantry doctrinally perfectly corresponds to the US Army Stryker doctrine, where only one platoon per company is equipped with a 105mm Mobile Gun System (MGS). The MGS vehicle does not have the ballistic protection of a tank but more that of an APC, as it is not meant to fight with tanks or against IFVs, but to provide direct fire support to the infantry riding around the battlefield in APCs.

The SAF has vehicles in its inventory that provide the crew with 360° protection against 14.5mm machine guns and can supposedly even protect frontally against 30mm APFSDS. They also protect against 10kg anti-tank mines (Balažić, 2010, p.9 & Gregorčič, 2012). This corresponds to STANAG 4569 level K4/Mb3 at a minimum. This is due to the fact that the vehicles were intended to equip a mechanised battalion for the purposes of creating a framework for a mechanised battalion battle group in line with the Capability Goals valid at that time (SOPR 2007-20012 & SOPR 2013-2018). A mechanised battalion battle group at that time required IFVs capable of fighting with tanks⁸. However these vehicles were later only equipped with 0.50 calibre machine guns and 40mm automatic grenade launchers, due to procurement issues; they therefore cannot be treated as IFVs⁹.

Apparently SAF plans to have two battalions equipped with IFVs (30mm cannon, ATGW and K4/Mb3 level of protection). Such vehicles are however still not capable of fighting with tanks and are still vulnerable to IFV escorting tanks. For the purpose of fighting with tanks and against enemy IFVs, NATO has heavy infantry units with K5/Mb3 level of protection.

⁸ NATO requirements for different types of capabilities are regularly publicized in Bi-SC Capability Codes and Capability Statements. Relevant to us are the 2008, 2011 and 2016 editions. In CC&CS 2008 we can find capabilities as they pertained to light, medium and heavy infantry; in it we could find very specific requirements for a medium infantry battalion group – 31xIFVs (wheeled or tracked) with a cannon or 21xIFVs and 10xtanks. The 2011 CC&CS have changed that into motorized and mechanized infantry, where motorized infantry was equal to 2008 light infantry and mechanized infantry combined the 2008 medium and heavy infantry. The 2011 CC&CS did not specifically state the details for the vehicles but it was clear from the list of required capabilities that mechanized infantry should have IFVs. The 2016 CC&CS however returned to the light, medium and heavy classification, but this time it is specifically stated that medium infantry is equipped with APCs and heavy infantry with IFVs. It does not however state whether these vehicles are tracked or wheeled.

⁹ As already mentioned the vehicle needs to have all three elements (protection, mobility, firepower) corresponding to IFV level. If it fails in any of the elements it cannot be considered an IFV.

It may look like a good solution to have better protection than required in combination with cannon. It would of course be pointless to argue against less protection for the troops. However we believe these vehicles to be a good solution only as long as the SAF medium infantry will be doctrinally used as dismounted infantry with vehicles in support. Any other use has a large potential for unwanted catastrophic results. We believe this that the temptation to use the vehicles in an IFV role, with the infantry mounted until the last possible moment, will be too much for the commanders to resist.

4 SLOVENIAN ARMED FORCES OPTIONS REGARDING VEHICLES IN MEDIUM UNITS

The SAF now has several options on how to proceed in building the INF-M-BNG with 30mm cannon.

One option for the SAF would be to procure additional 8x8 vehicles already in its inventory, with the addition of a 30mm cannon on some or all of these so that they can provide the required direct support to dismounted infantry. This would be the optimal option from a purely military perspective. However, due to serious political constraints¹⁰, this option is out of the question.

The first viable option (COA1) is for the SAF to form two medium infantry battalions in accordance with Stryker doctrine¹¹ with a PLT of cannon-equipped vehicles per manoeuvre company (FM 3-21.31, 2003). In this case cannon-equipped vehicles on an existing SAF 8x8 chassis (K4/Mb3) could even risk engaging enemy IFVs, but they should not get decisively engaged. This would, however, present an issue of combining different types of combat vehicles at company level. Therefore it would be better to equip manoeuvre companies with a single type of vehicle. This would potentially be the best option, and the SAF would fulfil its Capability Targets 2017 as they relate to INF-M-BNG¹². There would also be very little need to invent our own tactical doctrine as to how to utilise this unit, since it would basically correspond to the US Stryker units. Above all such a unit would be perfectly in line with ATP 3.2.1.

¹⁰ *Having in mind the fact that the original procurement of the 8x8 vehicles was clouded by corruption charges at the highest levels of government in Slovenia.*

¹¹ *"The SBCT achieves decisive action with combined arms at the infantry company level by applying the effects of direct fire from the mobile gun system (MGS), indirect fire from mortars and artillery, and joint effects of other services to support the infantry assault. (p.1-1)....The infantry battalions (Figure 1-5, p.1-14) serve as the primary maneuver force for the brigade and are designed as a three-by-three organization of three rifle companies with three rifle platoons each. Companies fight as combined arms teams with a section of organic 81-mm mortars, an MGS platoon, and a sniper team (p.1-13)." Ppk. Burggrave in his SAMS essay points out that budgeting issues have resulted in not all Stryker companies being equipped with MGS PLT. Instead MGS vehicles were held at BDE level. This of course took away much of the desired COY level combined arms capabilities. One of the ways to get around this issue is to introduce 30mm cannon to COY level (Burggrave, 2016, pp.39-46).*

¹² *Assuming there is no requirement in any of the Alliance documents (CLASSIFIED) for all vehicles in maneuver companies to be equipped with 30mm cannons. In that case a platoon of 30mm guns per company would suffice. It would be very hard to understand why a Alliance expert would demand all APCs to be equipped with a 30mm cannon, but we recognize this is a possibility.*

The second viable option (COA 2) is to procure a new type of vehicle¹³ for the medium battalions of the SAF, and equip all of the vehicles in manoeuvre companies with a 30mm cannon. Here too the SAF must make a decision whether or not to include the existing SVARUN 8x8 vehicles into such formations. However, such vehicles, in accordance with CC&CS16 and Capability Goals 2017, would still basically be APCs, and therefore the units manoeuvre would still have to be based primarily on dismounted infantry. Such a unit would also be hard-pressed to bring all of its firepower to bear. The cannon would also represent a temptation for the SQD and PLT leaders to decisively engage enemy IFVs – a fight they could not win, due to the inferior protection and mobility. This is even the US Army Stryker units' experience from NTC (King, 2017).

However, it seems that the SAF will go with COA 2 and procure a new type of 8x8 cannon-equipped vehicles (BOXER)¹⁴. In addition these will have the same level of protection and mobility as the existing 8x8 vehicles. This is an unnecessary waste of already very limited resources. Such vehicles are not required for medium infantry and will give their users a false sense of security and capability. Leaders and commanders will tend to treat them as IFVs, which they are not, and the consequences will be disastrous.

It is also of interest to note the above options through their financial consequences, as presented below in Tables 1 to 3. They are based on the following assumptions:

- That the SAF will require from 136 to 160 8x8 vehicles in order to equip its two INF-M-BNGs¹⁵;
- That a manoeuvre company consists of fourteen 8x8 vehicles;
- That the prices found on www.army-guide.com are roughly realistic in terms of the relationship between the prices of a pure APC compared with an APC with a gun turret¹⁶.

For comparison purposes the option with Patria AMV vehicles is included in the tables, although we recognise it is politically unacceptable. The first point to notice from the tables is a considerable increase in cost when we increase the vehicles' protection level from K3/2b to K4/3b. In the case of Piranha vehicles, the difference is anywhere from 168 million EUR to 228 million EUR, depending on the chosen

¹³ Not necessarily new vehicles directly from a production line; it should be a new platform (APC instead of IFV) currently non-existent in the SAF – but it could also be used or leased.

¹⁴ The Government has been informed of the intention to join OCCAR (the organization managing BOXER vehicles) in FEB 2018 (http://www.mo.gov.si/si/medijsko_sredisce/novica/8235/) and its proposal (http://www.vlada.si/delo_vlade/dnevni_redi/dnevni_redi/article/185_redna_seja_vlade_rs_dne_26_julija_2018_61563/) to join OCCAR to Parliament has been submitted (<https://siol.net/novice/slovenija/vlada-v-dz-s-pobudo-za-pravno-podlago-za-nakup-oklepnikov-473811>)

¹⁵ The difference in numbers being the direct fire support platoon IAW Stryker doctrine in COA 1. This additional fire support platoon in a company would consist of four (4) 8x8 vehicles equipped with 30mm cannons.

¹⁶ We compared the price of the BOXER with (LAT) and without a turret (DEU, NDL), the LAV III with (CAN) and without (US Stryker) a turret, and the PATRIA AMV with (POL Rosomak) and without (SVN) a turret (Source: www.army-guide.com).

option. It also follows from the tables that what we consider as optimal (COA1) is not necessarily the most affordable option. This is due to the fact that COA 1 has 24 more vehicles, and when this is considered, the cost difference is not as great. Also 12 more vehicles per battalion means much more space for different enablers to be transported around the battlefield. According to the calculations, COA 2 would more affordable, but for the reasons specified above, it is still not an optimal solution. As for combining different types of vehicles in manoeuvre units, we believe the logistical problems of having different vehicle types are simply not worth the financial savings, especially for an army of our size.

Table 1:
Piranha III

	SAF SVARUN (PATRIA AMV)	PATRIA AMV	Piranha III (in accordance w/NATO min. requirements K3/2b)	Total vehicles	Total cost (million EUR)
Unit cost	0 EUR	3M EUR	2.5M EUR		
30mm Turret cost	300k EUR	3.3M EUR	3.0M EUR		
N.A.	30	24w/t+106		160	397,2
		100w/t+6		136	348,0
COA1	30		24w/t+106	160	337,0
			24w/t+136		412,0
COA2	30		100w/t+6	136	315,0
			100w/t+36		390,0

Table 2:
Piranha V

	SAF SVARUN (PATRIA AMV)	PATRIA AMV	Piranha V (exceeding NATO min. requirements – K4/3b)	Total vehicles	Total cost (million EUR)
Unit cost	0 EUR	3M EUR	3.9M EUR		
30mm Turret cost	300k EUR	3.3M EUR	4.6M EUR		
N.A.	30	24w/t+106		160	397,2
		100w/t+6		136	348,0
COA1	30		24w/t+106	160	523,8
			24w/t+136		640,8
COA2	30		100w/t+6	136	483,4
			100w/t+36		600,4

Table 3:
BOXER

	SAF SVARUN (PATRIA AMV)	PATRIA AMV	BOXER (exceeding NATO min. requirements – K4/3b)	Total vehicles	Total cost (million EUR)
Unit cost	0 EUR	3M EUR	4.9M EUR		
30mm Turret cost	300k EUR	3.3M EUR	5.9M EUR		
N.A.	30	24w/t+106		160	397,2
		100w/t+6		136	348,0
COA1	30		24w/t+106	160	661,0
			24w/t+136		808,0
COA2	30		100w/t+6	136	619,4
			100w/t+36		766,4

Conclusion The INF-M-BNG presents a major challenge for the SAF. The decisions it will make concerning it will have a determining influence on the future of the SAF, and the wrong decisions will have disastrous consequences. The SAF and its civilian leadership are focusing on the INF-M-BNG as the core SAF capability for national and NATO tasks. In all honesty the 2xINF-M-BNG are the only military relevant contributions the SAF are making to NATO. But the doctrinal approach the SAF has taken is misaligned with NATO's doctrinal purpose and tasks for medium infantry. There is also the question of understanding the role of the SAF's INF-M-BNG in its national and NATO defence plans, as we can find no discussion on that within the SAF.

At the centre of it all are the vehicles. From both the doctrinal and budgetary perspectives they will have determining effects on the SAF for the next 20-30 years. They have the potential to make or break the SAF. Perhaps part of the problem is in understanding NATO doctrine and plans; maybe the SAF has put too little effort into understanding it.

Above all the SAF needs to understand that the vehicles are not a solution on their own. Having big shiny toys with great cannons will mean very little if the people operating them are not trained in proper doctrine and do not intimately understand the vehicles' capabilities and limitations and the roles they can(not) play on the battlefield.

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