Avoid surprise and circumvention

Capability innovation

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Introdction

Action Terrestre has initiated a multidimensional reflection on the air-land combat of tomorrow. The army will play an essential role in this debate, and its equipment must therefore be part of the debate by integrating the points raised.

In French doctrine, strategic surprise is defined as a situation of shock or psychological and organisational astonishment resulting from an adverse offensive action, revealing a relative unpreparedness of the victim and requiring him to adjust the means, or even the objectives of his strategic posture.

Innovation, whether tactical, organisational or purely technical, is defined as an essential means of destabilising the adversary by using postures and methods for which the latter is unprepared.

Thus, if the symmetrical enemy must be taken as a reference to justify the next generation of equipment and thus innovation, it is indeed the asymmetry that characterizes the totality of current conflicts. Similarly, if frontal attack remains the major threat, thinking about the risk hanging over modern Western armies in terms of lateral strategy, i.e. based on surprise and circumvention, also remains relevant.

However, the loss or lack of certainties about the nature of our future enemy has kept us in this logic of seeking technological superiority at all costs. Is technological superiority enough to prevent us from surprise and circumvention? In other words, to what extent will capability innovation enable us to deal with contemporary threats?

In concrete terms, strategic surprise can be translated in several ways. It can take the form of tactical or technical innovations, whose cumulative effects or sudden revelation cause a player's strategy to be called into question. Strategic surprise can also come from a loss of autonomy in certain areas. Thus would we have been able to take Mosul autonomously? However, in the majority of cases, if the introduction of a military innovation in the conflict field contributes to creating an effect of surprise at the tactical or operational level, it very rarely takes on a strategic dimension. Thus, we must think of innovation in the short, medium and long term as being linked to the tactical, operational or strategic effects it will enable us to achieve.

The globalisation of trade has contributed to the emergence of new processes of diffusion of sensitive technologies, more opaque to state controls, and which may constitute options of choice for sub-state actors wishing to compensate for their weakness by the violence and suddenness of their actions. The diffusion of capacities thus confers a considerable potential of constraint on actors who were previously without them. Should we continue to produce and sell sensitive equipment to states at the risk of finding it in the hands of our adversaries? And conversely, does off-the-shelf procurement not represent an opportunity for our Forces to compensate for innovation processes that are often considered too long and too costly?

Finally, the opportunities for strategic surprise offered by the fluidity of movements in the information field and the increasingly close dependence of companies on the information society are a source of great surprise.s to automated systems are forcing us to be more resilient, to duplicate capabilities and to maintain the ability to fight in degraded mode.

Part One

Action Terrestre Future has characterized the transformation of the threat through three major trends: the geographical proximity of the hotbeds of war, a continuity of the threat outside our borders and on our territory, the failure of supranational modes of regulation which makes a return to war between States possible. Consequently, integrating Eastern ways of thinking requires moving from the ATF observation to the spectrum of possible types of threat without any notion of probability. The existing official documentation is sufficiently explicit; the first part of this document will not provide new analyses but will make it possible to link the findings and recommendations.

The distinction between a symmetrical, asymmetrical and asymmetrical enemy remains relevant because it is not a fixed grid. Indeed, the changing geopolitical situation and new modes of action - which make organised gangs act like states and certain states like organised gangs - militate in favour of considering the threat in the broadest possible

spectrum in order to think about circumvention and guard against strategic surprise. The high probability of all types of combat in urban areas is obvious.

The resurgence of symmetrical threats

First of all, the resurgence of a symmetrical type of threat cannot be ignored. The rearmament and the increase in military budgets of certain countries illustrate their desire to take or regain a prominent place on the world chessboard. This positioning goes hand in hand with the removal of certain ethical barriers that cast doubt on the reasoned use of artificial intelligence and autonomous systems. French technological excellence enables us to face this technological race, to be interoperable with our allies and to remain credible in deterrence. Nevertheless, if technological downgrading is a hypothesis to be ruled out, it is a question of not exhausting ourselves in the technological leap for two reasons:

-the countries that could be our symmetrical adversaries have a stability in their defence effort that does not vary with the powers that be because

- by definition - they don't change. They are therefore better able to plan coherent, long-term programmes without the tyranny of the short term. They have very few limitations. Time is on their side;

-the deterrent that still plays its full role continues its paralysis of armed confrontation. But new phenomena of circumvention have appeared with the cyber-weapon or the hybridity of the conflict in Ukraine for a very low technological cost.

Faced with an enemy that could be of a slightly lower technological level but which would compensate with a mass of saturation, it is necessary to ask the question of the technological whole which can only cover a small part of the spectrum. The question of frugal innovation or a more numerous fleet with all the necessary capabilities and just enough technology resurfaces. It would have the advantage of responding to dilution and concentration at the same time, and would make the force less vulnerable to the cyber threat. Some capabilities need to be renewed to avoid a strategic surprise linked to the loss of know-how of the CBRN or ground-to-air defence type (case of the denial of access strategy).

The question for a symmetrical enemy is therefore the credibility of our force vis-à-vis that of our potential adversaries in all areas. Will we be able to support the technological race imposed by maintaining our independence in critical weapons programmes?

Asymmetrical conflicts: a constant

Currently, asymmetric conflicts have mobilized the Army for more than 20 years. It faces mafia-type terrorist groups that make effective use of the virtually free movement of goods, persons and information. It is an enemy that has nothing to lose and that, aware of its weakness, works in a strategy of permanent circumvention, seeking to create strategic surprises through the astonishment of our public opinion. It has a capacity for almost permanent regeneration as long as it is not destroyed. It benefits from the freedom of financial flows and therefore can more easily acquire more advanced technologies at lower cost. This technological levelling could allow them to feed a strategy of denial of access and challenge us for air superiority in a theatre. It also takes advantage of the freedom of movement of people that erases the front lines and establishes all-out continuity and permanence of combat.

This makes it necessary to reconsider three imperatives:

-reverse the principle of uncertainty.

-giving our tool the gift of ubiquity with an agile, unpredictable and fast army.

-to have a capacity for lightning strikes.

In the face of an enemy that de-skills itself and uses all the facilities of globalization. It is a question of seeking a lower cost of the weapon used - therefore little technology - to destroy. Indeed, it will be necessary to produce them ad infinitum while preserving the rusticity allowed by the quality of production. In this type of conflict, knowledge will be a factor of success. Some room for manoeuvre at low cost seems to be available. The question of the complete autonomy of the crews, very far (and for a long time) from the central point of the force arises, including from an energy, maintenance and supply point of view.

The decision-making level will be closer to the action, which will require a combination of ease of use and the ability to discriminate.

How to be everywhere, all the time, in order to seize any opportunity that would hinder the freedom of action of the asymmetric enemy? Digital mass and low cost appear to be the main avenues for reflection.

The complexity of the asymmetric conflict

Geopolitical instability supports the possibility of asymmetric conflict with the use of conventional armaments outside any framework, as the conflict in Ukraine in 2014 has shown. This is the most complex because it involves covering the whole spectrum of capability options by adding a doctrinal dimension resulting from strategic thinking conducted in conjunction with politics. The intelligence capability is therefore fundamental and coupled with the versatility of our forces.

Faced with an enemy whose nature and modes of action are constantly changing, we

must not under any circumstances limit the range of possibilities and hence the doctrinal exploration. Research and development must be stepped up, not necessarily in connection with on-board or off-board technology, but in the fields of biology, genetics, cyber... The development of the soldier's increased capability through, for example, an exoskeleton or the taking of drugs is to be studied.

It seems urgent to reconsider a certain number of our practices in order to protect ourselves from surprise and circumvention.

This includes :

-an adaptation of the capacity development to the inflection that is taking place;

-maintaining the technological whole and striving for excellence in a certain part of capability development;

-a race for technology limited to just enough of our needs and international commitments so as not to risk being stifled by our adversaries;

-the adoption of frugal innovation for some of our capabilities to meet the imperatives imposed by long asymmetric battles;

-innovations in the doctrinal field.

Part Two

Among the factors increasing the risk of strategic surprise and circumvention, some could arise from our own capability choices and their confrontation with developments on the international scene.

The context that saw the emergence of the SCORPION project, discussed in Action Terrestre Future and taken up in the exploratory doctrine SCORPION, explains the presuppositions retained for the development of the Army's capabilities:

-the proliferation of weapons technologies causes a technological levelling;

NICTs must accelerate the decision-making loop;

-combat operations are no longer impervious to information warfare;

-Finally, the armed groups we are facing have proven their ability to adopt strategies to circumvent power.

It is therefore necessary to sift through the army's capability choices to try to envisage what our vulnerabilities to strategic surprise and circumvention might be.

Maintaining our strategic autonomy

Some technologies, for which national production capacity has disappeared, will not be able to be produced again for several years. During that time we will, in fact, be dependent on our allies for certain capabilities such as drones, tankers, utility helicopters and others. If the United States were engaged in a multi-confrontation, would we be sure of their support for these critical capabilities? In a related area, recent engagements have shown the need for "strategic stocks" of ammunition: are these sufficiently large and varied? The inadequacy of strategic stocks had already been a lesson from the 1991 Gulf War. Maintaining our strategic autonomy could therefore involve strengthening our partnerships and off-the-shelf purchases to limit dependence on our allies in the short term. In the medium term, reinvestment in national production capacities that have disappeared is desirable, even if it means relying on bi- or multi-national agreements, or even on the EU to capture resources while remaining a leader in development. An audit of strategic stocks could be envisaged without delay.

Strengthening the protection of our critical vulnerabilities

The economic context effectively limits France's defence ambitions, forcing us to strike a balance between quantity (to achieve the operational superiority factor Mass) and quality (to maintain a technological advantage over our present and future enemy). The SCORPION programme thus foresees the arrival of major equipment by 2025, with, for example, 936 GRIFFON, 150 SERVAL, 489 JAGUAR and 122 LECLERC refurbished (STD1). These figures should make it possible to meet the needs of the SCORPION force, however they represent a lower volume of VHL than those they replace (P4, VAB, VBL, etc.).

The valuation info should make it possible to create more bills of exchange with less SHV. However, this is based on an information system - and on radio sets - which should make it possible to create the "SCORPION bubble" - which will multiply the effects of friendly players. Our ability to produce this information bubble and to maintain it in the face of attacks is therefore of prime importance, as the SCORPION programme has been designed around this communication and integration capacity.

Without it, the reduced number of VHLs, armoured vehicles and tanks may not be sufficient to tip the balance of power in our favour. In this context, our ability to generate and maintain the communication bubble essential to the SCORPION force is a critical vulnerability. However, the context of rapidly developing electronic warfare and cyber warfare capabilities could make this critical vulnerability easier to achieve than expected. On 10 April 2014, an American destroyer, the USS Donald Cook, was reportedly rendered deaf and blind (its AEGIS system rendered inoperable) by a Russian SU-24 equipped with an electronic warfare pod called Jibiny1.

Periods of operational fragility

Annex 1 presents the schedule for the arrival of the new generation equipment, which takes over from the previous generation, which is overused and whose technical operational availability is dropping sharply. The transition period between old and new equipment reveals momentary "capacity gaps", with new equipment sometimes arriving after the end of the life of the old equipment. The enemy could exploit these periods of relative operational fragility. If the defence budget were to play the role of an adjustment variable, as it has done in the past, what solution could be found to compensate for the capability gap caused by the late arrival of major equipment, in a possible context of high-intensity engagement?

The resilience of our DTIB is a challenge

The desire to bring the industrial world closer together - in a virtuous reciprocity between economic patriotism and patriotic economy - reflects the will to develop our capacity production apparatus. The effectiveness of the partnership between the armed forces and the defence industry, in a word the effectiveness of our DTIB, is therefore a major challenge. This is evidenced by the DGA reform, whose objectives (1/ Working in teams 2/Working faster 3/Balancing relations between the Ministry and industrialists) speak for themselves. In addition to monitoring the effectiveness of our DTIB, its resilience in the event of a major commitment is a challenge of at least the same dimension. Do we now have indicators to measure this resilience capacity, attack scenarios and the corresponding drilled procedures? Efforts focused on innovation (Defence Innovation Forum, DGA Lab, Battle L ab of armies, dedicated credits (RAPID), etc.) can make it possible to gain resilience in this area, by shortening acquisition cycles and diversifying the players. The protection of these new players, more numerous and less old, must nevertheless be the subject of particular attention.

Doctrinal renewal and the arrival of SCORPION The CEMAT has defined three major dimensions for the French Army: organisation (with the On Contact model), equipment (with the capability transition, of which Scorpion is the most emblematic aspect) and guidance (with Action Terrestre Future). The development of the SCORPION system of systems has incidentally produced an awareness of the need to start developing a capability with its doctrine. Until then, capabilities had often been produced with a view to renewing and improving existing capabilities. In this framework, the new material produced, a doctrine - conceived as the definition of the area of use maximising the effectiveness of that material - was produced a posteriori. This shortcoming was described by two Chinese army colonels, Qiao LIANG and Wang XIANGSUI in War Outside Bounds, who describe it as a Western mode of action: the West would "wage war with its weapons", when it would be more effective, in their view, to manufacture weapons that corresponded to our conception of warfare. The concept of exploratory doctrine, born out of the SCORPION project, takes on its full meaning from this point of view. In this exploratory doctrine, the focus is on the mastery of knowledge as a fundamental factor in achieving tactical superiority. The mode of action envisaged is the acceleration of the decision-making loop, which should make it possible to take, or retake the ascendancy by imposing our rhythm on the enemy. The major equipment of the SCORPION project has therefore been designed according to this doctrine, and interconnects in an information bubble that allows for a multiplication of its effects, and which in particular allows for a particularly successful level of integration of effects. The introduction of cyber weapons, autonomous systems, including terrestrial ones, and

artificial intelligence must continue, as they are likely to allow strategic surprise or circumvention.

"Surprising an adversary also implies the transgression of certain moral or politico-legal norms, in particular when a war is launched by surprise or when an attack is aimed at previously unscathed civilian populations - circumstances in which strategic effect is assured. Does this imply revising the range of modes of action by introducing the acceptance of a transgression of these same rules and thus innovating in the field of our doctrine? We deliberately leave out of our field of reflection this area which appears to us to be beyond a civilizational line".

The SCORPION project represents a major step forward. The transition from a logic of replacing capabilities, equipment family by equipment family, to a single, integrated programme has already borne fruit. A doctrine developed upstream of the arrival of major combat equipment, and simultaneously with the development of armament programmes, offers much greater added value than a doctrine designed after the fact, such as the definition of the area in which equipment can be made more effective.

Part Three

Common Proposals

Based on the threat assessment and the analysis of the vulnerabilities of our system carried out earlier, the purpose of this section is to make a number of concrete proposals to guard against strategic surprise and circumvention. These proposals take into account the various constraints of the capability approach, particularly financial, and are aimed at the entire DORESE spectrum (not just the equipment).

Faced with an enemy operating in an urban area, which is a levelling ground par excellence, it is essential to build up real expertise in urban areas within TF units, in the same way as other environmental expertise (forest, mountain, amphibious, airborne):

-Firstly, to create ZUB kits for landed fighters, like the checkpoint kits of yesteryear. Most often, and this was also the case in Fallujah for the Americans, the troops obtain the indispensable "small equipment" (ladders, rams, paint cans, mirror poles, etc.) via a "D-system"/do-it-yourself system. This is unsatisfactory for several reasons: on the one hand, such equipment would represent a small investment but is often forgotten in the capability process, and on the other hand, it can have a particularly significant effect on operational effectiveness. All the feedback from operations and rotations at CENZUB testify to this. Even in limited quantities, this equipment could, if necessary, be stored in a "war stockpile" and used if need be (also in the TN in the event of a major crisis);

-At the training level, this implies a more pronounced effort on this environment in the operational preparation or even specialisation of elementary units.

Faced with the IED/Mines threat, which will be a permanent feature of future conflicts, especially in the ZUB :

-in terms of land mobility, strengthen our means of opening up routes and develop land transport UAVs (to limit the exposure of our convoys in particular);

-to regain a real capacity for trenching (a priori tracked, therefore), like all the major military powers.

Faced with the increased transparency of the battlefield, develop the use of deception in all its components:

-reinvest in traditional camouflage know-how and develop the means of deception offered by new technologies; 13

-to take greater account of disappointment in our higher military education, planning and modes of action;

-in the same vein, but to better combat enemy disappointment, accelerate the commissioning of micro- and nano-UAVs, so that we no longer have to expose soldiers/vehicles to go and see "the other side of the hill".

Faced with the manipulation of populations, particularly in Africa, improve and coordinate our modes of action in terms of influence (which is closely linked to understanding):

-In the context of the PMO's growing importance, make this mechanism a lever of increased influence by developing a real PMO-COOP channel at the HR level;

-create a technical diploma in the main African languages (in this order of priority: Bambara, Swahili and Wolof). The resources to be devoted to this will have to be found by rationalizing at the joint level the training courses in the "flagship" languages (Russian, Chinese, Arabic), where redundancies exist;

-always in the linguistic field and in the particular context of theatre openings, rely on the partnership between the CDEC and the INALCO to accelerate and make training in rare languages or dialects (Kurdish, for example) more flexible. Indeed, language training is often only envisaged as part of a course and not necessarily when necessary. However, this would contribute to our agility and strengthen our understanding and, to a certain extent, our influence;

-always on the knowledge side, complementing the "doctrine pack" with an "environment pack" and the use for the MCF of mentors with a recent knowledge of theatre (as was done at the DAO in Canjuers).

Facing an asymmetric enemy

Faced with an enemy who will try to drag us away from our bases, in sanctuaries that are difficult to access, we will find true operational mobility:

-drones bi- or even tri-charge (ROEM, ROIM and weaponry);

-heavy maneuver helicopters, which on the one hand will guarantee our strategic autonomy and on the other hand will reduce the exposure of our convoys to IEDs;

-reinforce our capabilities in terms of maritime crossing and transhipment, specific capacities which are very insufficient today.

These capability gaps, which are currently partially filled (for heavy MHs or UAVs) by the use of allied means, would justify off-the-shelf purchases given their considerable cost.On the one hand, because of their tactical shortcomings, but on the other hand, because they are a precondition for genuine strategic autonomy, the reinternalisation of the sector should be considered.

Faced with a symmetrical enemy

Faced with the CYBER threat, which is, for a certain number of actors, a means of regaining freedom of action within a general framework of nuclear deterrence:

-in terms of equipment, continue the hardening of our CIS. In addition to this technical response, systematically integrate a CYBER threat into exercises so that CONPLANS and degraded procedures are regularly worked on. This is not currently the case;

-Integrate into the design of new vehicles degraded combat capabilities, including at night (optical sights for example) to cope with a network outage or an EMI for example.

Faced with an enemy mass:

Reinvest high-intensity know-how (doctrine and C2 efforts) based on major exercises. The conduct of these major exercises must also be rethought so that they are not just a simple drill of procedures: LIVEX, J+N planks, PC switches actually played, etc..;

Have (confidential) plans for power-up and test them by exercises such as "RO2 mobilisation", "RO1 mobilisation at full capacity". This implies a forward-looking assignment of these reservists, aimed at optimising their employment in the event of a serious and sudden crisis. An essential complement to these plans is the establishment of strategic stocks.

Faced with the contestation of our air superiority, find a real ground-to-air defence capability to support it, in terms of the quantity of ASA assets and equipment which would, unlike PAMELA, be capable of withstanding the scrap metal of the battlefield.

Faced with the denial of access, increase our long-range action capabilities:

-continue the development of long-range ground fire, by further exploring the shell options, too quickly dismissed by the "missiles lobby";

-increase our infiltration capabilities ("very high altitude" under oxygen; submarine; etc.). COS is currently conducting several experiments and studies on these subjects.

Conclusion

On 31 August last, President Macron recalled his ambition for the Armed Forces: "the French Army will remain the first in Europe and the second in the free world". To that end, the LPM 19-25 marks a significant increase in the budgets of the Armed Forces, with nearly €197.8 billion planned between 2019 and 2023. Within this LPM, innovation appears to be a major lever to guarantee France's strategic autonomy and the operational superiority of our Armed Forces. Among the defined objectives, one is particularly precise: "to equip ourselves with the tools and processes to accelerate the dissemination of innovations, to better integrate innovation from the civilian sector and to better take into account disruptive innovation".

In concrete terms, this LPM calls on the Army to :

-reinforce its capability vision in the conduct of investments;

-Improve the adequacy of equipment to its needs, both in terms of functionality and cost and in terms of availability;

-to confer more agility and adaptability to the acquisition process;

-to better integrate into programmes the MCO of equipment, its cost of use and the associated infrastructures.

As we have seen, the threats to be taken into account in the capability innovation process are of very different types, probability of occurrence and importance. However, none of these threats can be excluded from our fields of study and exploration in a constrained budgetary, legal and political context. To meet the ambitions set by the Nation, the legal and administrative straitjacket in which the innovation policy is set must therefore be relaxed, the supply channels must be multiplied in order to shorten as much as possible the innovation loop, which goes from the identification of a need to its delivery to the Forces, and finally, the Forces must be given priority. Our operational capability depends on it.

1- According to the Russian publication Rossiyskaya Gazeta (edition of April 30, 2014)

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