Autonomous weapons systems as a new means of warfare conduct.

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Approaching the end of 2025, and consequently completing the first quarter of the 21st century, we observe facts and changes that seemed completely unimaginable in the early 2000's. Those changes, mostly owed to the rapid outburst of technological development, have significantly affected all the aspects of life, both private and collective. In this sense, warfare as an existing part of contemporary life, is also transforming, taking advantage of all the facilitations that the new technological achievements have to offer. In other words, exploitation of such improvements, and particularly those of AI (Artificial Intelligence) technology, which offer autonomy to the new weapon systems, is one of the main pillars of the so called "7th Generation Warfare"[1]. The investigation of this exact aspect of "Modern Warfare", namely the use of autonomous weapons on the battlefield will be the topic of my contribution to this panel.

The term "autonomous weapons systems"

Although, up to this point, an official term of autonomous systems is not provided by "hard law", relevant widespread state practice indicates their common understanding as weapon systems which, leveraging AI, are capable to select and / or engage their targets on their own, without depending on human interference[2]. In order to better highlight this idea, it is useful to employ terminology appearing in military doctrines. After all, military doctrines can function as a potential "soft law" source in positive law's absence.

Commencing the term's analysis, it is clear that first and foremost we are talking about weapons. This means systems that are used by one armed force in order to employ kinetic activity which will deliver effects, whether lethal or not, against the adversary. Kinetic activity, as opposed to the non – kinetic one, refers to activities executed in the physical domain of the battlefield, as opposed to the cyberspace and cognitive one. In other words, we talk about systems that directly and visibly affect the adversary, causing changes or, as per military

doctrine, effects in their behavior. Those effects can be destructive (lethal) or degrading (non – lethal) towards the adversary's capabilities.[3] Despite the fact that this characterizations of activities and effects appear as such in military doctrines which receive endorsement from many countries such as NATO's Allied Joint Publication 5 (AJP5)[4], it is quite often that people employ the adjective "lethal" in order to refer to kinetic activities. This explains the term "Lethal Autonomous Weapon Systems" or briefly "LAWS" which is frequently used. It is not meant that those weapons necessarily destroy their targets, but that they do engage them physically regardless of the level of damage achieved, which is assessed a posteriori.

The element of autonomy and "LAWS" categories.

"LAWS" can select and engage targets without human interference. A target is the object of the weapons' attack. Targeting doctrines indicate that a target can be anything, dividing them in five categories, name a Facility, an Individual, a Virtual entity, a piece of Equipment or an Organization (FIVE-O). Targeting as part of offensive military operations we could argue that it consists of two big components to which different individual military processes contribute. Those components are the target selection and the target engagement. Target selection in this sense addresses the choice of the targets towards whom the attack will be launched. This process occurs at the strategic and operational level of military command, where the targeting team, in compliance with issued strategic guidelines, identifies targets of interest, whose engagement gets approval from the operation's commander. The launch of the attack is the target engagement and its planning starts from the operational and extends to the tactical level of military command[5].

This is important to clarify, as the common perception of "LAWS" as capable to select and engage targets on their own could imply that targeting processes are suspended or transformed during their employment. This is only a misconception owed to semantics. Targeting processes at the strategic and operational level are executed in the same manner regardless of the weapon used for the attack. What changes is that at the tactical level the autonomous weapon is capable to recognize, identify and after that engage the targets that

satisfy the criteria of an adequate target for the mission as concluded and imposed by the higher levels of hierarchy through the targeting processes.

Moreover, this capability's extend varies amongst the different autonomous weapon systems. In fact, based on that criterion, "LAWS" are divided in three relevant categories. The "semi – autonomous" systems, which autonomously engage targets that have been selected a priori by a human operator. The "supervised autonomous" weapons that independently both select and engage the target, however a human operator can in anytime intervene and abort the activity. Lastly, there are the "fully autonomous" weapons, which select and engage targets without any human interference. These categories are also respectively referred to as "human - in - the – loop", "human - on - the - loop" and "human - out - of - the - loop" autonomous weapons systems.[6] The loop addressed is the so called "OODA" (Observe – Orient – Decide – Act) loop, a model developed by USAF Colonel John Boyd for tactical level combat operations' decision making.[7]

Each category contributes different advantages to the combat but is also accompanied by different drawbacks. Semi – autonomous systems, provide a sense of security of compliance with the LOAC (Law of Armed Conflict), as the large involvement of the human operator in their targets' selection ensures avoidance of indiscriminate attacks. On the contrary, human intervention costs in time, slowing down the whole attack and consequently risking its success, in the contemporary battlefield where time as a factor is of critical importance. Supervised autonomous weapons, due to the minimized by critical human intervention capability, combine a faster battle rhythm with the safety net of human presence and consequent LOAC compliance during the attack. On the other hand, fully autonomous systems ensure time responsive, fast and accurate attacks but the human absence and the consequent sole reliance on the machine's software provokes discomfort and raises several ethical questions.

The question of "War Ethics".

In fact, the question of war ethics is one of the main problematic issues sourcing from the use of "LAWS" in general. "LAWS", emerging from the latest

technological improvements, are very recent means of warfare conduct. Hence, their use in the battlefield has not yet been regulated by positive law. The notion of trusting the decision of an attack to a software, that possesses neither human conscience nor human heart, could not been foreseen in 1980 when the "Convention on Certain Conventional Weapons" (CCW), which is the treaty that regulates the use of weapons that can cause superfluous injury and lead to indiscriminate attacks, was concluded, as the technology had not yet progressed as much. Furthermore, leaving the decision of attack to the weapon itself, thus substituting human decision making on life or death, upgrades the weapon from warfare means to a warfare actor. Such an upgrade however is not feasible as the actor status contains inherent accountability for somebody's actions. It is evident that accountability of an indiscriminate attack cannot be either attributed or enforced to an object as its actions lack of mens rea.[8,9] Machines and technology in general should be in people's service in order to promote their wellbeing and prosperity, and in the context of "LAWS" as Pope Francis stated while addressing the G7 Summit in June 2024: "No machine should ever choose to take the life of a human being". All those points lead to the conclusion that a certain degree of effective human control during "LAWS" employment is necessary. This is also enforced by "Martens Clause", a general principle of International Humanitarian Law that dictates in cases of lacunae protection of civilians and combatants under the laws of humanity and public conscience. Machines do not possess those characteristics. As a result, their actions need to be controlled, at least up to a certain point, by humans that do possess them instead.[10]

"LAWS" advantages.

While the legal review of those new weapons is ongoing in the auspices of article 36 of Additional Protocol I of the 1949 Geneva Conventions, in search of the golden mean between the weapons autonomy and the effective human control over them, the use of "LAWS" on the contemporary active battlefields has turned into common practice. In fact, large scale attacks are executed on a daily basis, using "LAWS" as the primary weapon. For example, the Russian Federation executes frequent attacks towards Ukraine with the "Shahed" type

Unmanned Air Vehicles (UAVs). This extensive use could only indicate that "LAWS" employment offers advantages to the owner armed force.

In order to investigate what could those advantages be, we will use the practical example of a recent attack that was executed with "LAWS". We will remain at the Russian – Ukrainian front, but this time the attack was launched by Ukraine against the Russian Federation. We are examining the operation with code name "Spider web". On June 1st 2025, Ukrainian forces smuggled mini tetra copter FPV (First Person View) kamikaze UAVs in the inner land of Russian Federation. Human operators remotely navigated the drones towards five major Russian air force bases (Belaya, Dyagilevo, Ivanovo, Olenya and Ukrainka Air Force Base). The drones were programmed to search for and attack strategic bomber aircrafts on the airfields' aprons. And so they did. The result was "brilliant" as the Ukrainian President V. Zelensky posted on his "X" account. A first estimate from Ukrainian officials suggested that this attack degraded around 30% of Russian Strategic Attack capability[11]. As this is a significant loss for the attacked party, there can be observed many advantages drawn from attacks of such kind.

First and foremost, the cost – benefit scale of this attack indicates that the latter is disproportionately bigger that the first. The drones used on Operation "Spider web" cost approximately 400$ each and provoked a loss of 7 billion $ worth to the Russians. "LAWS" in general seem to be a very economical choice, because of their small cost production and their lesser needs for operational capability sustainment material, as their need for fuel for example[12]. Funds play a key role for the long term sustainment of an operational campaign. Thus, selecting cheaper yet effective weapons, contributes directly to maintaining the operations longer[13].

Moreover, the effect that those kamikaze drones created, cost the Russians heavily in long range attack capability, as it deprived them of the ability to strike important hardened facilities from a safe big distance, thus forcing them to operate close to the borders, exposing their assets to the threat of Ukrainian Air Defense systems[14]. This means the risk of losing the asset. The asset, having a certain, sometimes quite big for example for fighters jets,

production cost is difficult to be replaced. Furthermore, there is a bigger risk while operating platforms close to the borders. The assets, except for “LAWS” of course, are manned. The human operator is on the asset, hence their life is also at risk, costing also human resources and operational knowledge to the attacked party. This is very important as the human critical thinking applied to operational and tactical knowledge cannot be substituted by any machine. Consequently, it is apparent that “LAWS” employment minimizes the risk of human resources loss to the attacking party[15]. This is directly linked with the “Economy of Forces” as one of War’s core principles.

Furthermore, operating the attacking weapon from a safe far distance offers one more big advantage. The so called “cold blood”. Executing an attack from afar gives the operator a chance to revise the tactical situation and ensure the attack complies with the LOAC principles, without being influenced of “the heat of the moment” due to a potential risk for their own life. In this way, the operator is more focused on the attack’s execution, leading to more precise strikes, which help to reduce the risk of collateral damage and to protect the life on non – combatants[16]. In addition to that, strike precision ensures achievement of the tactical objective, avoiding the necessity of a follow - up attack, helping to the overall evolution and effectiveness of the operation, and simultaneously saving weaponry to the attacking party.

Conclusion.

Summing it all up, despite the controversy concerning war ethics, actual battlefield practice proves the use of “LAWS” to be practical and effective. Is it realistic though, for countries other than those relying on own weapon manufacturing, to plan, execute and sustain a war campaign based on “LAWS” employment? Sticking to the case of the Russian – Ukrainian war, individual attacks with “LAWS” as the main targeting weapon have been observed on behalf of Ukraine. Nonetheless, their total war effort is not based on drone attacks. On the other hand, Russia is basing its war of attrition against Ukrainian capabilities with daily massive Shahed attacks; UAVs that they locally produce. Establishing a local “LAWS” manufacturing capability is the key element for countries to adopt tactics based on “LAWS” employment, enjoying the

advantages they offer. Establishing this capability, however, requires adequate state support in many ways, such as funding, investment on Research and Development, encouragement of scientists to settle and establish activity in the country. Yet, it is achievable, as current operations indicate. What is for sure is that “LAWS” presence on the battlefields is skyrocketing, pointing out to common war state practice, with an urgent need for adequate regulation and control[17]. As Stephen Hawking said “Intelligence is the ability to adapt to change” and “LAWS” seem to have introduced an indubitable change to the war “modus operandi”. So, instead of leaving the matter unhandled, we need to embrace this advantageous change and properly adapt to it.

Footnotes:

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