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Unmanned vehicles: Future military component or simple economy of means?

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1. Military and economical context

If the war in Kuwait saw the emergence of the cruise missile and satellite intelligence, the most recent wars in Iraq, Afghanistan, Libya and Mali brought unmanned aerial (surveillance and targeting) and ground (countering improvised explosive devices) vehicles to the fore. These robotic vehicles have become indispensable elements for armed forces after 15 years of asymmetrical conflicts. The military's interest in unmanned vehicles (UV) began with the reduction of defence budgets which led to downsizing, with the rise of casualty sensitivity and operational costs and finally with the growing ability to manage the streams of data required to understand the situation on the battlefield.

2. Unmanned aerial vehicles

The feedback from Afghanistan led French pilots (of the three services) to press for an in-depth study of military doctrine on the use of unmanned aerial vehicles (UAVs) in 2012. Still considered ten years ago as a simple way to save money by reducing the flight time of manned aircraft or improving the performance of an existing weapons system, UAVs earned their wings as an additional and specific player in air operations-

The French Air Force used temporary tactical means that proved their worth during operations and led to the acquisition of heavier operational means (MALE UAVs) purchased from the United States.

For these MALE (Medium Altitude Long Endurance) UAVs to become a full-fledged component, they will have to be armed and to be able to operate as a group and with other components during land or naval operations. French armed forces, as well as manufacturers, are now in favor of arming these UVs as it is already the case in England and Italy. The recent publication of an information report by French Senators Perrin and Roger "Observational UAVs and armed UAVs: a matter of sovereignty" on May 23, 2017 shows that the political reflection is mature and that a legislation is now required.



3. Unmanned terrestrial vehicles

The enemy's extensive use of improvised explosive devices (IEDs) as well as parcel bombs against allied convoys in Iraq, Afghanistan and Mali and for terrorist attacks on French soil led the French Army, Gendarmerie and police to use small ground mine-sweeping robots. Inexpensive, transportable, rapid and easy to use, these small ground robots used for observation and mine-sweeping missions are becoming increasingly common in theatres of operation.

The deployment of forces in hostile territory under the enemy's continuous observation caused the French Army to acquire tactical unmanned vehicles and later the ECA's IT180 rotary wing UAV (DROGEN). For the past three years, French combat engineers have been equipped with them to observe itineraries ahead of convoys and terrain around maneuvering troops.

The UVs used by the French Army (robots used for aerial observation and mine-sweeping) remain part of military unit's equipment and have quickly become indispensable in theatres of operation. They will however only be considered as a maneuvering component when they will be used in combination with "teams" of additional robots and on condition of an authorized lethal firing capacity.

4. Unmanned naval vehicles

For the French Navy, the issue with the use of UVs is both tactical and strategic as it is related to the geography of its missions.

The first zone covers approximately 13 million km² (Exclusive Economic Zone). The goal is to defend France economic and national interests in this zone by countering illicit activities with maritime police operations. The use of underwater "gliders" and UAVs based on board ships overseas could probably help with this.

The second maritime zone is in metropolitan France. The French Navy defends its strategic interests in this zone by surveilling the activities of foreign military. It ensures the safety of France's nuclear forces, its Strategic Ocean Force (FOST), and secures its access to the Atlantic and Mediterranean. There must never be the risk of a naval mine preventing this access. UV systems will help detect intruding submarines and ensure the absence of mines, hence, the development of the Navy future system for anti-mine operations (SLAMF). ECA intends to become one of the main players of this program, mine-sweeping having been its area of excellence for more than fifty years.

The third zone is foreign and coastal areas. France has carried out operations that are sometimes conspicuous and lowprofile, limited in time and in space. ECA Group is considering a new type of autonomous underwater vehicle: stealthy and reliable, with an average endurance, but equipped with a strong level of decisional autonomy.

5. Industrial issues

Set to become a true military component, the usefulness and potential of unmanned military vehicles leaves no choice. To ensure its strategic independence, France must urgently strengthen its UV manufacturing capabilities. It buys UVs from abroad while it can manufacture quality combat vehicles, aircraft and ships. French industries have all the assets to hold their own in terms of UVs. Why are they in this position? For more than twenty years, significant public investments were awarded to major French companies that

were not UV manufacturers and were never intended to be. They manufacture software and embedded sensors for UVs whose development was assigned to a specialist that could not choose its modularity (i.e. its compatibility with other equipment to ensure its cost-effectiveness for exportation), or to a small company, French or foreign, whose experience and industrial manufacturing capabilities were limited. France should consider the UV as a true military component, a platform whose development should be entrusted to a real UV manufacturer, the only one able to develop a product that meets all its specifications while adapted for the world market. No one would think of buying combat tanks, submarines or fighter planes built by electronics engineers. They are designed and produced by shipbuilders, or aircraft and vehicle manufacturers. The same logic should apply to UVs.

6. Towards a doctrine on unmanned vehicles operations in the armed forces?

Since the end of the cold war, French armed forces have a solid joint body of military concepts and doctrines rooted in the Capstone Concept for Military Operations (Concept d'Emploi des Forces in French) which was last updated in September 2013. The French joint Development, Concepts and Doctrine Centre (CICDE in French) published two years later an exploratory concept on unmanned combat aerial vehicles and systems operations. However, as technology advances quicker than doctrine, the evolving performance of UVs opens new horizons that deserve continuous studies far beyond the quest for savings in human and financial resources. French UVs manufacturers, pioneers in robotics such as ECA, are calling for a deep and open study of these advances by all stakeholders and are committed to take their part to it.